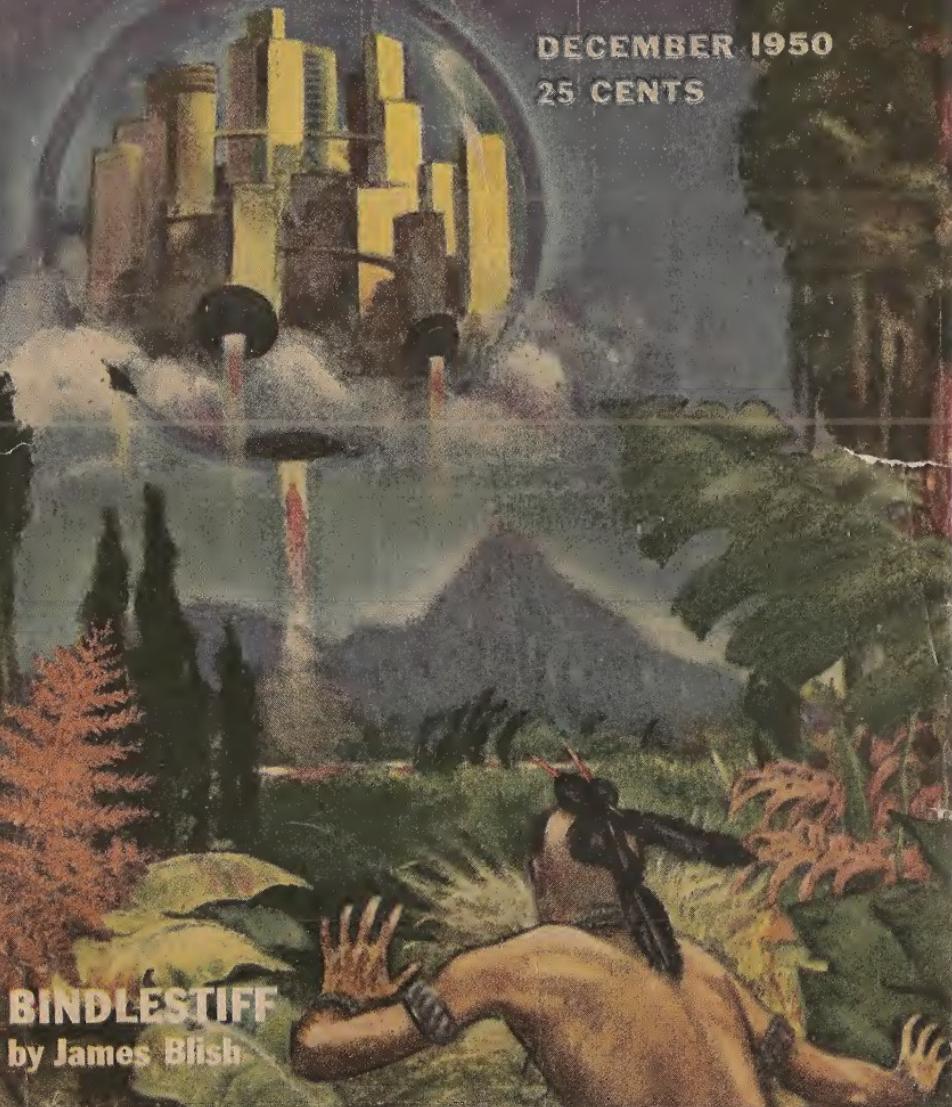


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25 CENTS



BINDLESTIFF
by James Blish



*

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FIGURES DON'T LIE

There's an old saying that "Figures don't lie, but liars figure." That sort of situation can be handled by the exercise of good judgment; the real trouble is caused by the honest man who misapplies, all unaware, mathematics to his concepts. There's many an instance in history where a given observation has been cited as proof of theory A—and, fifty years later, is in every textbook as one of the proofs of theory B, just one hundred eighty degrees out of phase with theory A.

A classic example of that, by the way, is the famous Michelson-Morley experiment. Originally set up to measure the velocity of the Earth with respect to the "ether," the experiment gave the observed data answer, "Zero." Interpreted in terms of modern physical understanding, it demonstrated that there was no "ether," and led to the development of modern relativistic theory. The same data, if it had been observed four or five centuries ago would have established once and for all, on the solid foundation of physical science demonstration, that the Earth was, in fact, the center of the Universe, the unmoving point about which the rest of the Universe turned.

The problem of interpreting data is the toughest of all problems in any field of science. One of the reasons mathematics is so useful to science is that its rigid, logical laws of manipulation force the scientist to examine his conclusions, and force him, like it or not, to inspect them in terms of their interactions, to determine whether the full consequences of the idea make sense.

Recently, the rise of the computing machine has been of immense importance, because it vastly speeds this mathematical investigation; it helps pin down theories, explodes ones that don't work, and speeds the applications of ones that do.

The use of a computing machine requires two essential factors: first, of course, the computing machine, and second, a team of highly skilled human experts who can apply the art of computing machine operation. And it is, be assured, an art.

The computerman must have some understanding of the field in which the problem being handled belongs, so that he can make a rough estimate of the probability of the answer received, and, if he finds it improbable, try to determine why he got such an

answer. The problem may have been wrongly posed, so that the computer is giving the correct answer to the wrong problem. But let's sum up the things the computer chief must consider when the answer looks improbable.

1. The answer is sound, and indicates a hitherto unsuspected phenomenon. (Imagine a physicist, circa 1935, asking a computer to calculate the location of a fifty-pound mass of U-235. If the problem had somehow been stated accurately, with all factors, the answer would have looked more than mildly fantastic.)
2. The answer is wrong, and one of the following has happened:

(a) The computing machine has broken down. (Present goal of the electronic digital computing machine designers; fifteen minutes of trouble-free operation.)

(b) The original equations sent over for computation were wrong in their derivation—or do not, in fact, apply in the case under study. (Useful information, naturally; it will force re-examination of the basic theory.)

(c) The equations were translated into computer-language incorrectly.

(d) The translation was fed into the machine incorrectly. A card or tape mispunched, or a dial wrongly set.

(e) An unexpected consequence of part of the solution

involves a transient value beyond the range available to the machine on the scale chosen, thus throwing the machine off scale and disrupting the entire computation from there on. (A twenty-digit machine, for instance, presented with a problem that, at one point, unexpectedly hits a twenty-one digit value, so that, for the rest of the computation, the machine is off by a factor of 10^{21} will cause trouble.)

(f) In a step-by-step solution, the time interval chosen may by ill chance, miss a critical, transient peak value of some function.

Many of these troubles could be avoided very easily—if the computer-man already knew the full answer to the problem. Sometimes the result given by the machine requires a negative value of a factor which no one suspected would acquire a negative value—and the machine was so set that no negative value for this factor was available to it.

All science consists of asking Nature questions, and getting answers. Nature always answers the question asked—but that is, all too often, quite different from the question the scientist intended to ask. Michelson-Morley, for instance, but fortunately they were scientists of first rank, big enough to recognize the answer Nature gave was "Your question is meaningless"; not "The Earth is the motionless center of the Universe."

THE EDITOR.

Astronomy. Hello, Jake. Can you figure me the distance of a star from the source of an ultraphone broadcast?"

"Why, yes," the phone said. "Wait, and I'll pick up your image. Ah—I see what you mean; something at 10:00 o'clock center, can't tell what yet. Dinwidgie pickups on your proxies? Intensity will tell the tale." The astronomer chuckled like a parrot on the rim of a cracker barrel. "Now if you'll just tell me how many proxies you have, and how far they—"

"Five. Full interval."

"Hm-m-m. Big correction." There was a long, itching silence. "Amalfi?"

"Yeah."

"About ten parsecs, give or take 0.4. I'd say you've found a floater, my boy."

"Thanks." Amalfi put the phone back and drew a deep breath. "What a relief."

"You won't find any colonists on a star that isolated," Hazleton reminded him.

"I don't care. It's a landing point, possibly a fuel or even a food source. Most stars have planets; a freak like this might not, or it might have dozens. Just cross your fingers."

He stared at the tiny sun, his eyes aching from sympathetic strain. A star in the middle of the Rift—almost certainly a wild star, moving at four hundred or five hundred k.p.s. It occurred to him that a people living on a planet of that star might remember the moment when it burst through the near wall and embarked

upon its journey into the emptiness.

"There might be people there," he said. "The Rift was swept clean of stars once, somehow. Jake claims that that's an overdramatic way of putting it, that the mean motions of the stars probably opened the gap naturally. But either way that sun must be a recent arrival, going at quite a clip, since it's moving counter to the general tendency. It could have been colonized while it was still passing through a populated area. Runaway stars tend to collect hunted criminals as they go by, Mark."

"Possibly," Hazleton admitted. "By the way, that image is coming in from your lead proxy, 'way out across the valley. Don't you have any outriggers? I ordered them sent."

"Sure. But I don't use them except for routine. Cruising the Rift lengthwise would be suicide. We'll take a look if you like."

He touched the board. On the screen, the far wall was wiped away. Nothing was left but thin haze; down at that end, the Rift turned, and eventually faded out into a rill of emptiness, soaking into the sands of the stars.

"Nothing there. Lots of nothing."

Amalfi moved the switch again.

On the screen, apparently almost within hallooing distance, a city was burning.

Space flight got its start, as a war weapon, amid the collapse of the great Western culture of Earth. In the succeeding centuries it was al-

most forgotten. The new culture, that vast planar despotism called by historiographers the Bureaucratic State, did not think that way.

Not that the original Soviets or their successors forbade space travel. They simply never thought of it. Space flight had been a natural, if late, result of Western thought-patterns, which had always been ambitious for the infinite, but the geometrically flat dialectic of the succeeding culture could not include it. Where the West had soared from the rock like a sequoia, the Soviets spread like lichens, tightening their grip, satisfied to be at the very bases of the pillars of sunlight the West had sought to ascend.

The coming of the spindizzy—the antigravity generator, or gravitron—spelled the doom of the flat culture, as the leveling menace of the nuclear reactor had cut down the soaring West. Space flight returned; not, this time, as a technique of tiny ships and individual adventure, but as a project of cities.

There was no longer any reason why a man-carrying vehicle to cross space needed to be small, cramped, organized fore-and-aft, penurious of weight. The spindizzy could lift anything, and protect it, too. Most important, its operation was rooted in a variation of the value of c as a limit. The overdrive, the meteor screen, and antigravity had all arrived in one compact package, labeled " $G = (2PC)^2/(BU)^2$ ".

Every culture has its characteristic mathematic, in which historiogra-

phers can see its inevitable form. This one, couched in the algebra of the Magian culture, pointing toward the matrix-mechanics of the new Nomad era, was a Western discovery. Blackett had found the essential relationship between gravity and magnetism, and Dirac had explained why it had not been detected before. Yet despite all of the minority groups butchered or "concentrated" by the Bureaucratic State, only the pure mathematicians went unsuspected about the destruction of that State, innocent even in their own minds of revolutionary motives.

The exodus began.

At first it was logical enough. The Aluminum Trust, the Thorium Trust, the Germanium Trust put their plants aloft bodily, to mine the planets. The Steel Trust made it possible for the rest, for it had turned Mars into the Pittsburgh of the solar system, and lulled the doubts of the State.

But the Thorium Trust's Plant No. 8 never came back. The revolution against the planar culture began as simply as that.

The first of the Okie cities soared away from the solar system, looking for work among the colonists—colonists left stranded among the stars by the ebb tide of Western civilization. The new culture began among these nomad cities, and before long Earth was virtually deserted.

But Earth laws, though much changed, survived. It was still possible to make a battleship, and the Okies were ungainly. Steam shovels,



BINDLESTIFF

BY JAMES BLISH

It was inevitable that, occasionally, one of the cruising cities of space would turn criminal. And they made vicious, deadly enemies!

Illustrated by Timmins

Even to the men of the flying city, the Rift was awesome beyond all human experience. Loneliness was natural between the stars, and star-men were used to it—the star-density of the average cluster was more than enough to give a veteran Okie claustrophobia; but the enormous empty

loneliness of the Rift was unique. To the best of Mayor Amalfi's knowledge, no Okie city had ever crossed the Rift before. The City Fathers, who knew everything, agreed. Amalfi was none too sure that it was wise, for once, to be a pioneer.

ASTOUNDING SCIENCE FICTION

Ahead and behind, the walls of the Rift shimmered, a haze of stars too far away to resolve into individual points of light. The walls curved gently toward a starry floor, so many parsecs "beneath" the keel of the city that it seemed to be hidden in a rising haze of star dust.

"Above," there was nothing; a nothing as final as the slamming of a door—it was the intergalactic gap.

The Rift was, in effect, a valley cut in the face of the galaxy. A few stars swam in it, light-millennia apart—stars which the tide of human colonization could never have reached. Only on the far side was there likely to be any inhabited planet, and, consequently, work for a migratory city.

On the near side there were the Earth police. They would not chase Amalfi's city across the Rift; they were busy consolidating their conquests of Utopia and the Duchy of Gort, barbarian planets whose ties with Earth were being forcibly re-established. But they would be happy to see the city turn back—there was a violation of a Vacate order still on the books, and a little matter of a trick—

Soberly, Amalfi contemplated the oppressive chasm which the screens showed him. The picture came in by ultrawave from a string of proxy-robots, the leader of which was already parsecs out across the gap. And still the far wall was featureless, just beginning to show a faintly granular texture which gave promise of resolution into individual

stars at top magnification.

"I hope the food holds out," he muttered. "I never expected the cops to chase us this far."

Beside him, Mark Hazleton, the city manager, drummed delicately upon the arm of his chair. "No reason why it shouldn't," he said lazily. "Of course the oil's low, but the Chlorella crop is flourishing. And I doubt that we'll be troubled by mutation in the tanks. Aren't ultronic nixi supposed to vary directly with star-density?"

"Sure," Amalfi said, irritated. "We won't starve if everything goes right. If we hadn't been rich enough to risk crossing, I'd of let us be captured and paid the fine instead. But we've never been as long as a year without planet-fall before, and this crossing is going to take all of the four years the Fathers predicted. The slightest accident, and we'll be beyond help."

"There'll be no accident," Hazleton said confidently.

"There's fuel decomposition—we've never had a flash-fire but there's always a first time. And if the Twenty-third Street spindizzy comks out again—"

He stopped abruptly. Through the corner of his eye, a minute pinprick of brightness poked insistently into his brain. When he looked directly at the screen, it was still there. He pointed.

"Look—is that a cluster? No, it's too small. If that's a free-floating star, it's close."

He snatched up a phone. "Give me

by and large, had been more characteristic of the West than tanks had been, but in a fight between the two the outcome was predictable; that situation never changed. The cities were the citizens—but there were still police.

And in the Rift, where there were no police, a city was burning.

It was all over in a few minutes. The city bucked and toppled in a maelstrom of lightning. Feeble flickers of resistance spat around its edges—and then it no longer had any edges. Sections of it broke off, and melted like wraiths. From its ardent center, a few hopeless life ships shot out into the gap; whatever was causing the destruction let them go. No conceivable life ship could live long enough to cross the Rift.

Amalfi cut in the audio circuit, filling the control room with a howl of static. Far behind the wild blasts of sound, a tiny voice was shouting desperately:

"Rebroadcast if anyone hears us. Repeat; we have the fuelless drive. We're destroying our model and evacuating our passenger. Pick him up if you can. We're being blown up by a bindlestiff. Rebroadcast if—"

Then there was nothing left but the skeleton of the city, glowing whitely, evaporating in the blackness. The pale, innocent light of the guide-beam for a Bethe blaster played over it, but it was still impossible to see who was wielding the weapon. The Dinwiddie circuits in the proxy were compensating for the

glare, so that nothing was coming through to the screen that did not shine with its own light.

The terrible fire died slowly, and the stars brightened. As the last spark flared and went out, a shadow loomed against the distant star-wall. Hazleton drew his breath in sharply.

"Another city! So some outfits really do go bindlestiff. And we thought we were the first out here!"

Amalfi nodded, feeling a little sick. That one city should destroy another was bad enough. But it was even more of a wrench to realize that the whole scene was virtually ancient history. Ultrawave transmission was faster than light, but by no means instantaneous; the dark city had destroyed its smaller counterpart nearly two years ago, and must now be beyond pursuit. It was even beyond identification, for no orders could be sent now to the proxy which would result in any action until another two years had passed.

"You'd think some heavy thinker on Earth would've figured out a way to make Diracs compact enough to be mounted in a proxy," he grumbled. "They haven't got anything better to do back there."

Hazleton had no difficulty in penetrating to the speech's real meaning. He said, "Maybe we can still smoke 'em out, boss."

"Not a chance. We can't afford a side jaunt."

"Well, I'll send out a general warning on the Dirac," Hazleton said. "It's barely possible that the cops will be able to invest the Rift

before the 'stiff gets out."

"That'll trap us neatly, won't it? Besides, that bindlestiff isn't going to leave the Rift."

"Eh? How do you know?"

"Did you hear what the SOS said about a fuelless drive?"

"Sure," Hazleton said uneasily, "but the guy who knows how to build it must be dead by now, even if he escaped the burning."

"We can't be sure of that—and that's the one thing that the 'stiff has to make sure of. If they get ahold of it, 'stiffs won't be a rarity any more. There'll be widespread piracy throughout the galaxy!"

"That's a big statement, Amalfi."

"Think, Mark. Pirates died out a thousand years ago on Earth when sailing ships were replaced by fueled ships. The fueled ships were faster—but couldn't themselves become pirates, because they had to touch civilized ports regularly to coal up. We're in the same state. But if that bindlestiff can actually get its hands on a fuelless drive—"

Hazleton stood up, kneading his hands uneasily. "I see what you mean. Well, there's only one place where a life ship could go out here, and that's the wild star. So the 'stiff is probably there, too, by now." He looked thoughtfully at the screen, now glittering once more only with anonymous stars. "Shall I send out the warning or not?"

"Yes, send it out. It's the law. But I think it's up to us to deal with the 'stiff; we're familiar with ways of manipulating strange cultures, where-

as the cops would just smash things up if they did manage to get here in time."

"Check. Our course as before, then."

"Necessarily."

Still the city manager did not go. "Boss," he said at last, "that outfit is heavily armed. They could muscle in on us with no trouble."

"Mark, I'd call you yellow if I didn't know you were just lazy," Amalfi growled. He stopped suddenly and peered up the length of Hazleton's figure to his long, horselike face. "Or are you leading up to something?"

Hazleton grinned like a small boy caught stealing jam. "Well, I did have something in mind. I don't like 'stiffs, especially killers. Are you willing to entertain a small scheme?"

"Ah," Amalfi said, relaxing. "That's better. Let's hear it."

II.

The wild star, hurling itself through the Rift on a course that would not bring it to the far wall for another ten thousand Earth years, carried with it six planets, of which only one was even remotely Earth-like. That planet shone deep, chlorophyll green on the screens long before it had grown enough to assume a recognizable disk shape. The proxies called in now, arrived one by one, circling the new world like a swarm of ten-meter footballs, eying it avidly.

It was everywhere the same: sav-

and bare ankles. Over it all the voices chanted like water flutes.

Amalfi's first wild reaction was to wonder why the City Fathers had been puzzled about the language. *These were human children.* Nothing about them showed any trace of alienage.

Behind them, tall black-haired men moved in less agile procession, sounding in chorus a single word which boomed through the skirl and pitter of the children's dance at wide-spaced intervals. The men were human, too; their hands, stretched immovably out before them, palms up, had five fingers, with fingernails on them; their beards had the same topography as human beards; their chests, bared to the sun by a symbolical rent which was torn at the same place in each garment, and marked identically by a symbolical wound rubbed on with red chalk, showed ribs where ribs ought to be, and the telltale tracings of clavicles beneath the skin.

About the women there might have been some doubt. They came at the end of the procession, all together in a huge cage drawn by lizards. They were all naked and filthy and sick, and could have been any kind of animal. They made no sound, but only stared out of purulent eyes, as indifferent to the Okie city and its owners as to their captors. Occasionally they scratched, reluctantly, wincing from their own claws.

The children deployed around Amalfi, evidently picking him out as the leader because he was the big-

gest. He had expected as much; it was but one more confirmation of their humanity. He stood still while they made a circle and sat down, still chanting and shaking their wrists. The men, too, made a circle, keeping their faces toward Amalfi, their hands outstretched. At last that reeking cage was drawn into the double ring, virtually to Amalfi's feet. Two male attendants unhitched the docile lizards and led them away.

Abruptly the chanting stopped. The tallest and most impressive of the men came forward and bent, making that strange gesture with fluttering hands over the street. Before Amalfi quite realized what was intended, the stranger had straightened, placed some heavy object in his hand, and retreated, calling aloud the single word the men had been intoning before. Men and children responded together in one terrific shout, and then there was silence.

Amalfi was alone in the middle of the circle, with the cage. He looked down at the thing in his hand.

It was—a key.

Miramont shifted nervously in the chair, the great black saw-toothed feather stuck in his topknot bobbing uncertainly. It was a testimony of his confidence in Amalfi that he sat in it at all, for in the beginning he had squatted, as was customary on his planet. Chairs were the uncomfortable prerogatives of the gods.

"I myself do not believe in the gods," he explained to Amalfi, bobbing the feather. "It would be plain



to a technician, you understand, that your city was simply a product of a technology superior to ours, and you yourselves to be men such as we are. But on this planet religion has a terrible force, a very immediate force. It is not expedient to run counter to public sentiment in such matters."

Amalfi nodded. "From what you tell me, I can believe that. Your situation is unique. What, precisely, happened 'way back then?"

Miramont shrugged. "We do not know," he said. "It was nearly eight thousand years ago. There was a high civilization here then—the priests and the scientists agree on that. And the climate was different; it got cold regularly every year, I am told, although how men could survive such a thing is difficult to understand. Besides, there were

many more stars—the ancient drawings show thousands of them, though they fail to agree on the details."

"Naturally. You're not aware that your sun is moving at a terrific rate?"

"Moving?" Miramont laughed shortly. "Some of our more mystical scientists have that opinion—they maintain that if the planets move, so must the sun. It is an imperfect analogy, in my opinion. Would we still be in this trough of nothingness if we were moving?"

"Yes, you would—you are. You underestimate the size of the Rift. It's impossible to detect any parallax at this distance, though in a few thousand years you'll begin to suspect it. But while you were actually among the stars, your ancestors could see it very well, by the chang-

agely tropical, in the throes of a geological period roughly comparable to Earth's Carboniferous era. Plainly, the only planet would be nothing but a way station; there would be no work for pay there.

Then the proxies began to pick up weak radio signals.

Nothing, of course, could be made of the language; Amalfi turned that problem over to the City Fathers at once. Nevertheless, he continued to listen to the strange gabble while he warped the city into an orbit. The voices sounded ritualistic, somehow.

The City Fathers said: "THIS LANGUAGE IS A VARIANT OF PATTERN G, BUT THE SITUATION IS AMBIGUOUS. GENERALLY WE WOULD SAY THAT THE RACE WHICH SPEAKS IT IS INGENUOUS TO THE PLANET, A RARE CASE BUT BY NO MEANS UNHEARD-OF. HOWEVER, THERE ARE TRACES OF FORMS WHICH MIGHT BE DEGENERATES OF ENGLISH, AS WELL AS STRONG EVIDENCES OF DIALECT MIXTURES SUGGESTING A TRIBAL SOCIETY. THIS LATTER FACT IS NOT CONSONANT WITH THE POSSESSION OF RADIO NOR WITH THE UNDERLYING SAMENESS OF THE PATTERN. UNDER THE CIRCUMSTANCES WE MUST POSITIVELY FORBID ANY MACHINATIONS BY MR. HAZLETON ON THIS VENTURE."

"I didn't ask them for advice,"

Amalfi said. "And what good is a lesson in etymology at this point? Still, Mark, watch your step—"

"Remember Thor V,'" Hazleton said, mimicking the mayor's father-hear voice to perfection. "All right. Do we land?"

For answer, Amalfi grasped the space stick, and the city began to settle. Amalfi was a true child of space, a man with an intuitive understanding of the forces and relationships which were involved in aeronautics; in delicate situations he invariably preferred to dispense with instruments. Sensitively he sidled the city downward, guiding himself mainly by the increasingly loud chanting in his earphones.

At four thousand meters there was a brief glitter from amid the dark-green waves of the treetops. The proxies converged upon it slowly, and on the screens a turreted roof showed; then two, four, a dozen. There was a city there—a homebody, grown from the earth. Closer views showed it to be walled, the wall standing just inside a clear ring where nothing grew; the greenery between the towers was camouflage.

At three thousand, a flight of small ships burst from the city like frightened birds, trailing feathers of flame. "Gunners!" Hazleton snapped into his mike. "Posts!"

Amalfi shook his head, and continued to bring his city closer to the ground. The fire-tailed birds wheeled around them, dipping and flashing, weaving a pattern in smoky plumes; yet an Earthman would have

thought, not of birds, but of the nuptial flight of drone bees.

Amalfi, who had never seen a bird or a bee, nevertheless sensed the ceremony in the darting cortège. With fitting solemnity he brought the city to a stop beside its jungle counterpart, hovering just above the tops of the giant cycads. Then, instead of clearing a landing area with the usual quick scythe of the mesotron rifles, he polarized the spindizzy screen.

The base and apex of the Okie city grew dim. What happened to the giant ferns and horsetails directly beneath it could not be seen—they were flattened into synthetic fossils in the muck in a split second—but those just beyond the rim of the city were stripped of their fronds and splintered, and farther out, in a vast circle, the whole forest bowed low away from the city to a clap of sunlit thunder.

Unfortunately, the Twenty-third Street spindizzy, always the weakest link, blew out at the last minute and the city dropped the last five meters in free fall. It arrived on the surface of the planet rather more cataclysmically than Amalfi had intended. Hazleton hung on to his bucket seat until City Hall had stopped swaying, and then wiped blood from his nose with a judicious handkerchief.

"That," he said, "was one dramatic touch too many. I'd best go have that spindizzy fixed again, just in case."

Amalfi shut off the controls with a contented gesture. "If that bindle-

stiff should show," he said, "they'll have a tough time amassing any prestige *here* for a while. But go ahead, Mark, it'll keep you busy."

The mayor eased his barrel-shaped bulk into the lift shaft and let himself be slithered through the friction fields to the street. Outside, the worn facade of City Hall shone with sunlight, and the City's motto—*MOW YOUR LAWN, LADY?*—was clear even under its encrustation of verdigris. Amalfi was glad that the legend could not be read by the local folk—it would have spoiled the effect.

Suddenly he was aware that the chanting he had been hearing for so long through the earphones was thrilling through the air around him. Here and there, the sober, utilitarian faces of the Okie citizens were turning to look down the street, and traces of wonder, mixed with amusement and an unaccountable sadness, were in those faces. Amalfi turned.

A procession of children was coming toward him: children wound in mummylike swatches of cloth down to their hips, the strips alternately red and white. Several free-swinging panels of many-colored fabric, as heavy as silk, swirled about their legs as they moved.

Each step was followed by a low bend, hands outstretched and fluttering, heads rolling from shoulder to shoulder, feet moving in and out, toe-heel-toe, the whole body turning and turning again. Bracelets of objects like dried pods rattled at wrists

ing positions of the neighboring suns."

Miramont looked dubious. "I bow to your superior knowledge, of course. But, be that as it may—the legends have it that for some sin of our people, the gods plunged us into this starless desert, and changed our climate to perpetual heat. This is why our priests say that we are in Hell, and that to be put back among the cool stars again, we must redeem our sins. We have no Heaven as you have defined the term—when we die, we die damned; we must win 'salvation' right here in the mud. The doctrine has its attractive features, under the circumstances."

Amalfi meditated. It was reasonably clear, now, what had happened, but he despaired of explaining it to Miramont—hard common sense sometimes has a way of being impenetrable. This planet's axis had a pronounced tilt, and the concomitant amount of libration. That meant that, like Earth, it had a Draysonian cycle: every so often, the top wabbled, and then resumed spinning at a new angle. The result, of course, was a disastrous climactic change. Such a thing happened on Earth roughly once every twenty-five thousand years, and the first one in recorded history had given birth to some extraordinarily silly legends and faiths—sillier than those the Hevians entertained, on the whole.

Still, it was miserable bad luck for them that a Draysonian overturn had occurred almost at the same time that the planet had begun its journey

across the Rift. It had thrown a very high culture, a culture entering its ripest phase, back forcibly into the Interdestructional phase without the slightest transition.

The planet of He was a strange mixture now. Politically the regression had stopped just before barbarism—a measure of the lofty summits this race had scaled at the time of the catastrophe—and was now in reverse, clawing through the stage of warring city-states. Yet the basics of the scientific techniques of eight thousand years ago had not been forgotten; now they were exfoliating, bearing "new" fruits.

Properly, city-states should fight each other with swords, not with missile weapons, chemical explosives, and supersonics—and flying should be still in the dream stage, a dream of flapping wings at that; not already a jet-propelled fact. Astronomical and geological accident had mixed history up for fair.

"What would have happened to me if I'd unlocked that cage?" Amalfi demanded suddenly.

Miramont looked sick. "Probably you would have been killed—or they would have tried to kill you, anyhow," he said, with considerable reluctance. "That would have been releasing Evil again upon us. The priests say that it was women who brought about the sins of the Great Age. In the bandit cities, to be sure, that savage creed is no longer maintained—which is one reason why we have so many deserters to the bandit

cities. You can have no idea of what it is like to do your duty to the race each year as our law requires. Madness!"

He sounded very bitter. "This is why it is hard to make our people see how suicidal the bandit cities are. Everyone on this world is weary of fighting the jungle, sick of trying to rebuild the Great Age with handfuls of mud, of maintaining social codes which ignore the presence of the jungle—but most of all, of serving in the Temple of the Future. In the bandit cities the women are clean, and do not scratch one."

"The bandit cities don't fight the jungle?" Amalfi asked.

"No. They prey on those who do. They have given up the religion entirely—the first act of a city which revolts is to slay its priests. Unfortunately, the priesthood is essential; and our beast-women must be borne, since we cannot modify one tenet without casting doubt upon all—or so they tell us. It is only the priesthood which keeps us fighting, only the priesthood which teaches us that it is better to be men than mud-puppies. So we—the technicians—follow the rituals with great strictness, stupid though some of them are, and consider it a matter of no moment that we ourselves do not believe in the gods."

"Sense in that," Amalfi admitted. Miramont, in all conscience, was a shrewd apple. If he was representative of as large a section of Hevian thought as he believed himself to be, much might yet be done on this wild

and untamed world.

"It amazes me that you knew to accept the key as a trust," Miramont said. "It was precisely the proper move—but how could you have guessed that?"

Amalfi grinned. "That wasn't hard. I know how a man looks when he's dropping a hot potato. Your priest made all the gestures of a man passing on a sacred trust, but he could hardly wait until he'd got it over with. Incidentally, some of those women are quite presentable now that Dee's bathed 'em and Medical has taken off the under layers. Don't look so alarmed, we won't tell your priests—I gather that we're the foster fathers of He from here on out."

"You are thought to be emissaries from the Great Age," Miramont agreed gravely. "What you *actually* are, you have not said."

"True. Do you have migratory workers here? The phrase comes easily in your language; yet I can't see how—"

"Surely, surely. The singers, the soldiers, the fruit-pickers—all go from city to city, selling their services." Suddenly the Hevian got it. "Do you . . . do you imply . . . that your resources are *for sale*? For sale to *us*?"

"Exactly, Miramont."

"But how shall we pay you?" Miramont gasped. "All of what we call wealth, all that we have, could not buy a length of the cloth in your sash!"

Amalfi thought about it, wonder-

ing principally how much of the real situation Miramon could be expected to understand. It occurred to him that he had persistently underestimated the Hevian so far; it might be profitable to try the full dose—and hope that it wasn't lethal.

"It's this way," Amalfi said. "In the culture we belong to, a certain metal, called germanium, serves for money. You have enormous amounts of it on your planet, but it's very hard to obtain, and I'm sure you've never even detected it. One of the things we would like is your permission to mine for that metal."

Miranon's pop-eyed skepticism was comical. "Permission?" he squeaked. "Please, Mayor Amalfi—is your ethical code as foolish as ours? Why do you not mine this metal without permission and be done with it?"

"Our law enforcement agencies would not allow it. Mining your planet would make us rich—almost unbelievably rich. Our assays show, not only fabulous amounts of germanium, but also the presence of certain drugs in your jungle—drugs which are known to be anti-agapics—"

"Sir?"

"Sorry, I mean that, used properly, they cure death."

Miramon rose with great dignity. "You are mocking me," he said. "I will return at a later date and perhaps we may talk again."

"Sit down, please," Amalfi said contritely. "I had forgotten that

death is not everywhere known to be a disease. It was conquered so long ago—before space flight, as a matter of fact. But the pharmaceuticals involved have always been in very short supply, shorter and shorter as man spread throughout the galaxy. Less than a two-thousandth of one percent of our present population can get the treatment now, and an ampoule of any anti-agapic, even the most inefficient ones, can be sold for the price the seller asks. Not a one of the anti-agapics has ever been synthesized, so if we could harvest here—"

"That is enough, it is not necessary that I understand more," Miramon said. He squatted again, reflectively. "All this makes me wonder if you are not from the Great Age after all. Well—this is difficult to think about reasonably. Why would your culture object to your being rich?"

"It wouldn't, as long as we got it honestly. We shall have to show that we worked for our riches. We'll need a written agreement. A permission."

"That is clear," Miramon said. "You will get it, I am sure. I cannot grant it myself. But I can predict what the priests will ask you to do to earn it."

"What, then? This is just what I want to know. Let's have it."

"First of all, you will be asked for the secret of this . . . this cure for death. They will want to use it on themselves, and hide it from the rest of us. Wisdom, perhaps; it would make for more desertions otherwise

—but I am sure they will want it."

"They can have it, but we'll see to it that the secret leaks out. The City Fathers know the therapy. What next?"

"You must wipe out the jungle."

Amalfi sat back, stunned. Wipe out the jungle! Oh, it would be easy enough to lay waste almost all of it—even to give the Hevians energy weapons to keep those wastes clear—but sooner or later, the jungle would come back. The weapons would disintegrate in the eternal moisture, the Hevians would not take proper care of them, would not be able to repair them—how would the brightest Greek have repaired a shattered X-ray tube, even if he had known how? The technology didn't exist.

No, the jungle would come back. And the cops would come to He to see whether or not the Okie city had fulfilled its contract—and would find the planet as raw as ever. Good-by to riches. This was jungle climate. There would be jungles here until the next Draysonian catastrophe, and that was that.

"Excuse me," he said, and reached for the control helmet. "Give me the City Fathers," he said into the mouthpiece.

"SPEAK," the spokesman vodeur said after a while.

"How would you go about wiping out a jungle?"

There was a moment's silence. "SODIUM FLUOSILICATE SPRAY WOULD SERVE. IN A WET CLIMATE IT WOULD

CREATE FATAL LEAF-BLISTER. ALSO THERE IS A FORGOTTEN COMPOUND, 2,4-D WHICH WOULD SERVE FOR STUBBORN SECTIONS. OF COURSE THE JUNGLE WOULD RETURN."

"That's what I meant. Any way to make the job stick?"

"NO, UNLESS THE PLANET EXHIBITS DRAYSONIANISM."

"What?"

"NO, UNLESS THE PLANET EXHIBITS DRAYSONIANISM. IN THAT CASE ITS AXIS MIGHT BE REGULARIZED. IT HAS NEVER BEEN TRIED, BUT THEORETICALLY IT IS QUITE SIMPLE; A BILL TO REGULARIZE EARTH'S AXIS WAS DEFEATED BY THREE VOTES IN THE EIGHTY-SECOND COUNCIL, OWING TO THE OPPOSITION OF THE CONSERVATION LOBBY."

"Could the city handle it?"

"NO. THE COST WOULD BE PROHIBITIVE. MAYOR AMALFI, ARE YOU CONTEMPLATING TIPPING THIS PLANET? WE FORBID IT! EVERY INDICATION SHOWS—"

Amalfi tore the helmet from his head and flung it across the room. Miramon jumped up in alarm.

"Hasleton!"

The city manager shot through the door as if he had been kicked through it on roller skates. "Here, boss—what's the—"

"Get down below and turn off the City Fathers—*fast*, before they catch on and do something! Quick, man!"

Hazleton was already gone. On the other side of the control room, the phones of the helmet squawked dead data in italic capitals.

Then, suddenly, they went silent.

The City Fathers had been turned off, and Amalfi was ready to move a world.

III.

The fact that the City Fathers could not be consulted—for the first time in two centuries—made the job more difficult than it need have been, barring their conservatism. Tipping the planet, the *cruz* of the job, was simple enough in essence; the spindizzies could handle it. But the side-effects of the medicine might easily prove to be worse than the disease.

The problem was seismological. Rapidly whirling objects have a way of being stubborn about changing their positions. If that energy were overcome, it would have to appear somewhere else—the most likely place being multiple earthquakes.

Too, very little could be anticipated about the gravitics of the task. The planet's revolution produced, as usual, a sizable magnetic field. Amalfi did not know how well that field would take to being tipped with relation to the space-lattice which it distorted, nor just what would happen when the spindizzies polarized the whole gravity field. During "moving day" the planet would be,

in effect, without magnetic moment of its own, and since the Calculator was one of the City Fathers, there was no way of finding out where the energy would reappear, in what form, or in what intensity.

He broached the latter question to Hazleton. "If we were dealing with an ordinary case, I'd say it would show up as velocity," he pointed out. "In which case we'd be in for an involuntary junket. But this is no ordinary case. The mass involved is . . . well, it's planetary, that's all. What do you think, Mark?"

"I don't know what to think," Hazleton admitted. "When we move the city, we change the magnetic moment of its component atoms; but the city itself doesn't revolve, and doesn't have a *gross* magnetic moment. Still—we could control velocity; suppose the energy reappears as heat, instead? There'd be nothing left but a cloud of gas."

Amalfi shook his head. "That's a bogey. The gyroscopic resistance may show up as heat, sure, but not the magnetogravitic. I think we'd be safe to expect it to appear as velocity, just as in ordinary spindizzy operation. Figure the conversion equivalency and tell me what you get."

Hazleton bent over his slide rule, the sweat standing out along his forehead and above his mustache in great heavy droplets. Amalfi could understand the eagerness of the Hevians to get rid of the jungle and its eternal humidity—his own clothing had been sopping ever since the city

had landed here.

"Well," the city manager said finally, "unless I've made a mistake somewhere, the whole kit and kaboodle will go shooting away from here at about half the speed of light. That's not too bad—less than cruising speed for us. We could always loop around and bring it back into its orbit."

"Ah, but could we? Remember, we don't control it! It appears automatically when we turn on the spindizzies. We don't even know in which direction we're going to move."

"Yes we do," Hazleton objected. "Along the axis of spin, of course."

"Can't? And torque?"

"No problem—yet there is. I keep forgetting we're dealing with a planet instead of electrons." He applied the slipstick again. "No soap. Can't be answered without the Calculator and he's turned off. But if we can figure a way to control the flight, it won't matter in the end. There'll be perturbations of the other planets when this one goes massless, whether it moves or not, but nobody lives there anyhow."

"All right, go figure a control system. I've got to get the Geology men to—"

The door slid back suddenly, and Amalfi looked over his shoulder. It was Anderson, the perimeter sergeant. The man was usually blasé in the face of all possible wonders, unless they threatened the city. "What's the matter?" Amalfi said, alarmed.

"Sir, we've gotten an ultracast from some outfit claiming to be refugees from another Okie—claim they hit a bindlestiff. They've crash-landed on this planet up north and they're being mobbed by one of the local bandit towns. They were holding 'em off and yelling for help, and then they stopped transmitting."

Amalfi heaved himself to his feet. "Did you get a bearing?" he demanded.

"Yes sir."

"Give me the figures. Come on, Mark. We need those boys."

They grabbed a cab to the edge of the city, and went the rest of the way on foot, across the supersonics-cleared strip of bare turf which surrounded the Hevian town. The turf felt rubbery; Amalfi suspected that some rudimentary form of friction-field was keeping the mud in a state of stiff gel. He had visions of foot-soldiers sinking suddenly into liquid ooze as defenders turned off the fields, and quickened his pace.

Inside the gates, the guards summoned a queer, malodorous vehicle which seemed to be powered by the combustion of hydrocarbons, and they were shot through the streets toward Miramon. Throughout the journey, Amalfi clung to a cloth strap in an access of nervousness. He had never traveled right *on* the surface at any speed before, and the way things zipped past him made him jumpy.

"Is this bird out to smash us up?" Hazleton demanded petulantly. "He

must be doing all of four hundred kilos an hour."

"I'm glad you feel the same way," Amalfi said, relaxing a little. "Actually I'll bet he's doing less than two hundred. It's just the way the—"

The driver, who had been holding his car down to a conservative fifty out of deference to the strangers, wrenched the machine around a corner and halted neatly before Miramon's door. Amalfi got out, his knees wobbly. Hazleton's face was a delicate puce.

"I'm going to figure a way to make our cabs operate outside the city," he muttered. "Every time we make a new planet-fall, we have to ride in ox carts, on the backs of bull kangaroos, in hot-air balloons, steam-driven airscrews, things that drag you feet first and face down through tunnels, or whatever else the natives think is classy transportation. My stomach won't stand much more."

Amalfi grinned and raised his hand to Miramon, whose expression suggested laughter smothered with great difficulty.

"What brings you here?" the Hevian said. "Come in. I have no chairs, but—"

"No time," Amalfi said. He explained the situation quickly. "We've got to get those men out of there, if they're still alive. This bandlestuff is a bandit city, like the ones you have here, but it has all the stuff we have and more besides. It's vital to find out what these survivors know about it. Can you locate the town that's

holding them? We have a fix on it."

Miramon went back into his house—actually, like all the other living quarters in the town, it was a dormitory housing twenty-five men of the same trade or profession—and returned with a map. The map-making conventions of He were anything but self-explanatory, but after a while Hazleton figured out the symbolism involved. "That's your city, and here's ours," he said, pointing. "Right? And this peeled orange is a butterfly grid. I've always claimed that was a lot more faithful to spherical territory than our parabolic projection, boss."

"Easier still to express what you want to remember as a topological relation," Amalfi grunted. "Show Miramon where the signals came from."

"Up here, on this wing of the butterfly."

Miramon frowned. "That can only be Fabr-Suite. A very bad place to approach, even in the military sense. However, we shall have to try. Do you know what the end result will be?"

"No; what?"

"The bandit cities will come out in force to hinder the Great Work. They do not fear you now—they fear nothing, we think they take drugs—but they have seen no reason to risk probable huge losses by attacking you. When you attack one of them, they will have that reason; they learn hatred very quickly."

Amalfi shrugged. "We'll chance it. We'll pick our own town up and

go calling; if they don't want to deliver up these Okies—"

"Boss—"

"Eh?"

"How are you going to get us off the ground?"

Amalfi could feel his ears turning red, and swore. "I forgot that Twenty-third Street machine. And we can't get anything suitable into a Hevian rocket—a pile would fit easily enough, but a frictionator or a dismounted spindizzy wouldn't, and there'd be no point in taking pop-guns— Maybe we could gas them."

"Excuse me," Miramon said, "but it is not certain that the priests will authorize the use of the rockets. We had best drive over to the temple directly and ask."

"Belsen and bebop!" Amalfi said. It was the oldest oath in his repertoire.

Talk, even with electrical aid, was impossible in the rocket. The whole machine roared like a gigantic tam-tam to the vibration of the jets. Morosely Amalfi watched Hazleton connecting the mechanism in the nose with the power-leads from the pile—no mean balancing feat, considering the way the rocket pitched in its passage through the tortured Hevian air currents. The reactor itself had not been filled all the way, since its total capacity could not have been used, and the heavy water sloshed and foamed in the transparent cube.

There had been no difficulty with the priests about the little rocket

task force itself. To the end of his life Amalfi was sure that the straight-faced Miramon had invented the need for religious permission, just to get the two Okies back into the ground car again. Still, the discomforts of that ride were small compared to this one.

The pilot shifted his feet on the treadles and the deck pitched. Metal rushed back under Amalfi's nose, and he found himself looking through misty air at a crazily canted jungle. Something long, thin, and angry flashed over it and was gone. At the same instant there was a piercing inhuman shriek, sharp enough to dwarf for a long instant the song of the rocket.

Then there were more of the same: *ptsouiiirrr! ptsouiiirrr! ptsouiiirrr!* The machine jerked to each one and now and then shook itself violently, twisting and careening across the jungle-top. Amalfi had never felt so helpless before in his life. He did not even know what the noise was; he could only be sure that it was ill-tempered. The coarse *blaam* of high explosive, when it began, was recognizable—the city had often had occasion to blast on jobs—but nothing in his experience went *kerchowkerchowkerchowkerchowkerchow* like a demented vibratory drill; and the invisible thing that screamed its own *pep-yell* as it flew—*eeeeeeeeyow-KRCHKackackarackarackarackaracka*—seemed wholly impossible.

He was astonished to discover that the hull around him was stippled with small holes, real holes with the



slipstream fluting over them. It took him what seemed to be three weeks to realize that the whooping and cheer-leading which meant nothing to him was riddling the ship and threatening to kill him any second.

Someone was shaking him. He lurched to his knees, trying to unfreeze his eyeballs.

"Amalfi! Amalfi!" The voice, though it was breathing on his ear, was parsecs away. "Pick your spot, quick! They'll have us shot down in a —"

Something burst outside and threw Amalfi to the deck. Doggedly he crawled to the port and peered down through the shattered plastic. The bandit Hevian city swooped past, upside down. He was sick suddenly, and the city was lost in a web of tears. The second time it came he managed to see which build-

ing had the heaviest guard, and pointed, choking.

The rocket threw its tailfeathers over the nearest cloud and bored beak-first for the ground. Amalfi hung on to the edge of the suddenly-blank deck port, his own blood spraying back in a fine mist into his face from his cut fingers.

"Now!"

Nobody heard, but Hazleton saw his nod. A blast of pure heat blew through the upended cabin as the pile blew off the shielded nose of the racket. Even through the top of his head, the violet-white light of that soundless concussion nearly blinded Amalfi, and he could feel the irradiation of his shoulders and chest. He would have no colds for the next two or three years, anyhow—every molecule of histamine in his blood must have been detoxified at that instant.

The rocket yawed wildly, and then came under control again. The ordnance noises had already quit, cut off at the moment of the flash.

The bandit city was blind.

The sound of the jets cut off, and Amalfi understood for the first time what an "aching void" might be. The machine fell into a steep glide, the air howling dismally outside it. Another rocket, under the guidance of one of Hazleton's assistants, dived down before it, scything a narrow runway in the jungle with a mesotron rifle—for the bandit towns kept no supersonic no-plant's-land between themselves and the rank vegetation.

The moment the rocket stopped moving, Amalfi and a hand-picked squad of Okies and Hevians were out of it and slogging through the muck. From inside the bandit city drifted a myriad of screams—human screams now, screams of agony and terror, from men who thought themselves blinded for life. Amalfi had no doubt that many of them were. Certainly anyone who had had the misfortune to be looking at the sky when the pile had converted itself into photons would never see again.

But the law of chance would have protected most of the renegades, so speed was vital. The mud built up heavy pads under his shoes, and the jungle did not thin out until they hit the town's wall itself.

The gates had been rusted open years ago, and were choked with greenery. The Hevians hacked their way through it with practiced

knives and cunning.

Inside, the going was still almost as thick. The city proper presented a depressing face of proliferating despair. Most of the buildings were completely enshrouded in vines, and many were halfway toward ruins. Iron-hard tendrils had thrust their way between stones, into windows, under cornices, up drains and chimney funnels. Poison-green, succulent leaves plastered themselves greedily upon every surface, and in shadowed places there were huge blood-colored fungi which smelled like a man six days dead; the sweetish taint hung heavily in the air. Even the paving blocks had sprouted—inevitably, since, whether by ignorance or laziness, most of them had been cut from green wood.

The screaming began to die into whimpers. Amalfi did his best to keep from inspecting the inhabitants. A man who believes he has just been blinded permanently is not a pretty sight, even when he is wrong. Yet it was impossible not to notice the curious mixture of soiled finery and gleamingly clean nakedness; it was as if two different periods had mixed in the city, as if a gathering of Hruntan nobles had been sprinkled with Noble Savages. Possibly the men who had given in completely to the jungle had also slid back far enough to discover the pleasures of bathing—if so, they would shortly discover the pleasures of the mud-wallow, too, and would not look so noble after that.

"Amalfi, here they are—"

The mayor's suppressed pity for the blinded men evaporated when he got a look at the imprisoned Okies. They had been systematically mauled to begin with, and after that sundry little attentions had been paid to them which combined the best features of savagery and decadence. One of them, mercifully, had been strangled by his comrades early in the "trial." Another, a basket case, should have been rescued, for he could still talk rationally, but he pleaded so persistently for death that Amalfi had him shot in a sudden fit of sentimentality. Of the other three men, all could walk and talk, but two were mad. The catatonic was carried out on a stretcher, and the manic was gagged and led gingerly away.

"How did you do it?" asked the rational man in Russian, the dead universal language of deep space. He was a human skeleton, but he radiated a terrific personal force. He had lost his tongue early in the "questioning," but had already taught himself to talk by the artificial method—the result was inhuman, but it was intelligible. "They were coming down to kill us as soon as they heard your jets. Then there was a sort of a flash, and they all started screaming—a pretty sound, let me tell you."

"I'll bet," Amalfi said. "That 'sort of a flash' was a photon explosion. It was the only way we could figure on being sure of getting you out alive. We thought of trying gas, but if they had had gas masks they

would have been able to kill you anyhow."

"I haven't seen any masks, but I'm sure they have them. There are traveling volcanic gas clouds in this part of the planet, they say; they must have evolved some absorption device—charcoal is well known here. Lucky we were so far underground, or we'd be blind, too, then. You people must be engineers."

"More or less," Amalfi agreed. "Strictly, we're miners and petroleum geologists, but we've developed a lot of sidelines since we've been aloft—like any Okie. Here's our rocket-crawl in. It's rough, but it's transportation. How about you?"

"Agronomists. Our mayor thought there was a field for it out here along the periphery—teaching the abandoned colonies and the offshoots how to work poisoned soil and manage low-yield crops without heavy machinery. Our sideline was waxmans."

"What are those?" Amalfi said, adjusting the harness around the wasted body.

"Soil-source antibiotics. It was those the bindlestiff wanted—and got. The filthy swine. They can't bother to keep a reasonably sanitary city; they'd rather pirate some honest outfit for drugs when they have an epidemic. Oh, and they wanted germanium, too, of course. They blew us up when they found we didn't have any—we'd converted to a barter economy as soon as we got out of the last commerce lanes."

"What about your passenger?"

Amalfi said with studied nonchalance.

"Dr. Beetle? Not that that was his name, I couldn't pronounce *that* even when I had my tongue. I don't imagine he survived; we had to keep him in a tank even in the city, and I can't quite see him living through a life-ship journey. He was a Myrdian, smart cookies all of them, too. That no-fuel drive of his?"

Outside, a shot cracked, and Amalfi winced. "We'd best get off—they're getting their eyesight back. Talk to you later, Hazleton, any incidents?"

"Nothing to speak of, boss. Everybody stowed?"

"Yep. Kick off."

There was a volley of shots, and then the rocket coughed, roared, and stood on its tail. Amalfi pulled a deep sigh loose from the acceleration and turned his head toward the rational man.

He was still securely strapped in, and looked quite relaxed. A brass-nosed slug had come through the side of the ship next to him and had neatly removed the top of his skull.

IV. *

Working information out of the madmen was a painfully long, anxious process. The manic was a three-hundred-fifty-hour case, and even after he had been returned to a semblance of rationality he could contribute very little.

The life ship had not come to He

because of the city's Dirac warning, he said. The life ship and the burned Okie had not had any Dirac equipment. The life ship had come to He, as Amalfi had predicted, because it was the only possible planet-fall in the desert of the Rift. Even so, the refugees had had to use deep-sleep and strict starvation rationing to make it.

"Did you see the 'stiff again'?"

"No, sir. If they heard your Dirac warning, they probably figured the police had spotted them and scampered—or maybe they thought there was a military base or an advanced culture here on the planet."

"You're guessing," Amalfi said gruffly. "What happened to Dr. Beetle?"

The man looked startled. "The Myrdian in the tank? He got blown up with the city, I guess."

"He wasn't put off in another life ship?"

"Doesn't seem very likely. But I was only a pilot. Could be that they took him out in the mayor's gig for some reason."

"You don't know anything about his no-fuel drive?"

"First I heard of it."

Amalfi was far from satisfied; he suspected that there was still a short circuit somewhere in the man's memory. The city's auditors insisted that he had been cleared, however, and Amalfi had to accept the verdict. All that remained to be done was to get some assessment of the weapons available to the bindlestiff; on this subject the manic was ignorant, but

the city's analyst said cautiously that something might be extracted from the catatonic within a month or two.

Amalfi accepted the figure, since it was the best he had. With Moving Day so close, he couldn't afford to worry overtime about another problem. He had already decided that the simplest answer to vulcanism, which otherwise would be inevitable when the planet's geophysical balance was changed, was to reinforce the crust.

All over the surface of He, drilling teams were sinking long, thin, slanting shafts, reaching toward the stress-fluid of the world's core. The shafts interlocked intricately, and thus far only one volcano had been created by the drilling—in general the lava-pockets which had been tapped had already been anticipated and the flow had been bled off into half a hundred intersecting channels without ever reaching the surface. After the molten rock had hardened, the clogged channels were drilled again, with mesotron rifles set to the smallest possible dispersion.

None of the shafts had yet tapped the stress fluid; the plan to complete them all simultaneously. At that point, specific areas, riddled with channel-intersections, would give way, and immense plugs would be forced up toward the crust, plugs of iron, connected by ferrous cantilevers through the channels between. The planet of He would wear a cruel corset, permitting not the slightest flexure—it would be stitched with threads of steel, steel that had held

even granite in solution for millennia.

The heat problem was tougher, and Amalfi was not sure whether or not he had hit upon the solution. The very fact of structural resistance would create high temperatures, and any general formation of shear-planes would cut the imbedded girders at once. The method being prepared to cope with that was rather drastic, and its after-effects unknown.

On the whole, however, the plans were simple, and putting them into effect had seemed heavy but relatively simple labor. Some opposition, of course, had been expected from the local bandit towns.

But Amalfi had not expected to lose nearly twenty percent of his crews during the first month.

It was Miramon who brought in the news of the latest camp found slaughtered. Amalfi was sitting under a tree fern on high ground overlooking the city, watching a flight of giant dragonflies and thinking about heat-transfer in rock.

"You are sure they were adequately protected?" Miramon asked cautiously. "Some of our insects—"

Amalfi thought the insects, and the jungle, almost disturbingly beautiful. The thought of destroying it all occasionally upset him. "Yes, they were," he said shortly. "We sprayed out the camp areas with dicoumarins and fluorine-substituted residuals. Besides—do any of your insects use explosives?"

"Explosives! There was dynamite used? I saw no evidence—"

"No. That's what bothers me. I don't like all those felled trees you describe. We used to use TDX to get a cutting blast; it has a property of exploding in a flat plane."

Miramon goggled. "Impossible. An explosion has to expand evenly in the open."

"Not if it's a piperazo-hexybitrate built from polarized carbon atoms. Such atoms can't move in any direction but at right angles to the gravity radius. That's what I mean. You people are up to dynamite, but not to TDX."

He paused, frowning. "Of course some of our losses have just been by bandit raids, with arrows and crude bombs—your friends from Fabr-Suite and their allies. But these camps where there was an explosion and no crater to show for it—"

He fell silent. There was no point in mentioning the gassed corpses. It was hard even to think about them. Somebody on this planet has a gas which was a regurgitant, a sternutatory and a vesicant all in one. The men had been forced out of their masks—which had been designed solely to protect them from volcanic gases—to vomit, had taken the stuff into their lungs by convulsive sneezing, and had blistered into great sacs of serum inside and out. That, obviously, had been the multiple-benzene ring Hawkesite; very popular in the days of the Hruntan Empire, when it had been called "polybathroom-floorine" for no discoverable reason. But what was it doing on He? -

There was only one possible answer, and for a reason which he did not try to understand, it made Amalfi breathe a little easier. All around him, the jungle sighed and swayed, and humming clouds of gnats made rainbows over the dew-laden pinnae of the fern. The jungle, almost always murmurously quiet, had never seemed like a real enemy; now Amalfi knew that that institution had been right. The real enemy had declared itself, stealthily, but with a stealth which was naïveté itself in comparison with the ancient guile of the jungle.

"Miramon," Amalfi said tranquilly, "we're in a spot. That city I told you about—the bindlestiff—is already here. It must have landed before we arrived, long enough ago to hide itself thoroughly. Probably it came down at night in some taboo area. The men in it have leagued themselves with Fabr-Suite, anyhow, that much is obvious."

A moth with a two-meter wing-spread blundered across the clearing, piloted by a gray-brown nematode which had sunk its sucker above the ganglion between the glittering creature's pinions. Amalfi was in a mood to read parables into things, and the parasitism reminded him anew of how greatly he had underestimated the enemy. The bindlestiff evidently knew, and was skillful at, the secret of manipulating a new culture; shrewd Okie never attempts to overwhelm a civilization, but instead pilots it, as indetectably as possible, doing no apparent harm, add-

ing no apparent burden, but turning history deftly and tyrannically aside at the crucial instant—

Amalfi snapped the belt switch of his ultraphone. "Hazleton?"

"Here, boss." Behind the city manager's voice was the indistinct rumble of heavy mining. "What's up?"

"Nothing yet. Are you having any trouble out there?"

"No. We're not expecting any, either, with all this artillery."

"Famous last words," Amalfi said. "The 'stiff's here, Mark."

There was a short silence. In the background, Amalfi could hear the shouts of Hazleton's crew. When the city manager's voice came in again, it was moving from word to word very carefully, as if it expected each one to break under its weight. "You imply that the 'stiff' was already on He when our Dirac broadcast went out. Right? I'm not sure these losses of ours can't be explained some other way, boss; the theory . . . uh . . . lacks elegance."

Amalfi grinned tightly. "A heuristic criticism," he said. "Go to the foot of the class, Mark, and think it over. Thus far they've out-thought us six ways for Sunday. We may be able to put your old plan into effect yet, but if it's to work, we'll have to provoke open conflict."

"How?"

"Everybody here knows that there's going to be a drastic change when we finish what we're doing, but we're the only ones who know exactly what we're going to do. The 'stiffs'

will have to stop us, whether they've got Dr. Beetle or not. So I'm forcing their hand. Moving Day is here-by advanced by one thousand hours."

"What! I'm sorry, boss, but that's flatly impossible."

Amalfi felt a rare spasm of anger. "That's as may be," he growled. "Nevertheless, spread it around; let the Hevians hear it. And just to prove that I'm not kidding, Mark, I'm turning the City Fathers back on at that time. If you're not ready to spin by then, you may well swing instead."

The click of the belt-switch to the "Off" position was unsatisfying. Amalfi would much have preferred to conclude the interview with something really final—a clash of cymbals, for instance. He swung suddenly on Miramon.

"What are you goggling at?"

The Hevian shut his mouth, flushing. "Your pardon. I was hoping to understand your instructions to your assistant, in the hope of being of some use. But you spoke in such incomprehensible terms that it sounded like a theological dispute. As for me, I never argue about politics or religion." He turned on his heel and stamped off through the trees.

Amalfi watched him go, cooling off gradually. This would never do. He must be getting to be an old man. All during the conversation he had felt his temper getting the better of his judgment, yet he had felt sodden and inert, unwilling to make the effort of opposing the momentum of

his anger. At this rate, the City Fathers would soon depose him and appoint some stable character to the mayoralty—not Hazleton, certainly, but some unpoetic youngster who would play everything by empirics. Amalfi was in no position to be threatening anyone else with liquidation, even as a joke.

He walked toward the grounded city, heavy with sunlight, sunk in reflection. He was now about a thousand years old, give or take fifty; strong as an ox, mentally alert and "clear," in good hormone balance, all twenty-eight senses sharp, his own special psi faculty—orientation—still as infallible as ever, and all in all as sane as a compulsively peripatetic star man could be. The anti-agapics would keep him in this shape indefinitely, as far as anyone knew—but the problem of patience had never been solved.

The older a man became, the more quickly he saw answers to tough questions; and the less likely he was to tolerate slow thinking among his associates. If he were sane, his answers were generally right answers; if he were insane, they were not; but what mattered was the speed of the thinking itself. In the end, both the sane and the unsane became equally dictatorial.

It was funny: before death had been conquered, it had been thought that memory would turn immortality into a Greek gift, because not even the human brain could remember a practical infinity of accumulated facts. Nowadays, however, nobody

bothered to remember many things. That was what the City Fathers and like machines were for; they stored facts. Living men memorized nothing but processes, throwing out obsolete ones for new ones as invention made it necessary. When they needed facts, they asked the machines.

In some cases, even processes were thrown out, if there were simple, indestructible machines to replace them—the slide rule, for instance. Amalfi wondered suddenly if there were a single man in the city who could multiply, divide, take square root, or figure pH in his head or on paper. The thought was so novel as to be alarming—as alarming as if an ancient astrophysicist had seriously wondered how many of his colleagues could run an abacus.

No, memory was no problem. But it was very hard to be patient after a thousand years.

The bottom of a port drifted into his field of view, plastered with brown tendrils of mud. He looked up. The port was a small one, and in a part of the perimeter of the city a good distance away from the section where he had intended to go on board. Feeling like a stranger, he went in.

Inside, the corridor rang with bloodcurdling shrieks. It was as if someone were flaying a live dinosaur, or, better, a pack of them. Underneath the awful noises there was a sound like water being expelled under high pressure, and someone

was laughing madly. Alarmed, Amalfi hunched his bull shoulders and burst through the nearest door.

Surely there had never been such a place in the city. It was a huge, steamy chamber, walled with some ceramic substance placed in regular tiles. The tiles were shiny, and stained; hence, old—very old.

Hordes of nude women ran aimlessly back and forth in it, screaming, battering at the wall, dodging wildly, or rolling on the mosaic floor. Every so often a thick stream of water caught one of them, bowling her howling away or driving her helplessly. Amalfi was soaking wet almost at once. The laughter got louder. Overhead, long banks of nozzles sprayed needles of mist into the air.

The mayor bent quickly, threw off his muddy shoes, and stalked the laughter, his toes gripping the slippery mosaic. The heavy column of water swerved toward him, then was jerked away again.

"John! Do you need a bath so badly? Come join the party!"

It was Dee Hazleton, the Utopian girl who had become the city manager's companion shortly before the crossing of the Rift had been undertaken. She was as nude as any of her victims, and was gleefully plying an enormous hose.

"Isn't this fun? We just got a new batch of these creatures. I got Mark to connect the old fire hose and I've been giving them their first wash."

It did not sound much like the old

Dee, who had been full of solemn thoughts about politics—she had been a veritable commissar when Amalfi had first met her. He expressed his opinions of women who had lost their inhibitions so drastically. He went on at some length, and Dee made as if to turn the hose on him again.

"No, you don't," he growled, wresting it from her. It proved extremely hard to manage. "Where is this place, anyhow? I don't recall any such torture chamber in the plans."

"It was a public bath, Mark says. It's in the oldest part of the city, and Mark says it must have been just shut off when the city went aloft for the first time. I've been using it to sluice off these women before they're sent to Medical. The water is pumped in from the river to the west, so there's no waste involved."

"Water for bathing!" Amalfi said. "The ancients certainly were wasteful. Still I'd thought the static jet was older than that."

He surveyed the Hevian women, who were now huddling, temporarily reprieved, in the warmest part of the echoing chamber. None of them shared Dee's gently curved ripeness, but, as usual, some of them showed promise. Hazleton was prescient; it had to be granted. Of course it had been expectable that the Hevian would turn out to be human, for only eleven nonhuman civilizations had ever been discovered, and of these only the Lyrans and the



Myrdians had any brains to speak of.

But to have had the Hevians turn over complete custody of their women to the Okies, without so much as a conference, at first contact—after Hazleton had proposed using any possible women as bindlestiff-bait—a proposal advanced before it had been established that there even was such a place as He-

Well, that was Hazleton's own psi-gift—not true clairvoyance, but an ability to pluck workable plans out of logically insufficient data. Time after time only the seemingly miraculous working-out of Hazleton's plans had prevented his being shot by the blindly logical City Fathers.

"Dee, come to Astronomy with

me," Amalfi said with sudden energy. "I've got something to show you. And for my sake put on something, or the men will think I'm out to found a dynasty."

"All right," Dee said reluctantly. She was not yet used to the odd Okie standards of exposure, and sometimes appeared nude when it wasn't customary—a compensation, Amalfi supposed, for her Utopian upbringing, where she had been taught that nudity had a deleterious effect upon the purity of one's politics. The Hevian women moaned and hid their heads while she put on her shorts—most of them had been stoned for inadvertently covering themselves at one time or another, for in Hevian society women were not people but reminders of damna-

tion, doubly evil for the slightest secrecy.

History, Amalfi thought, would be more instructive a teacher if it were not so stupefyingly repetitious. He led the way up the corridor, searching for a lift, Dee's wet soles padding cheerfully behind him.

In Astronomy, Jake was as usual peering wistfully at a nebula somewhere out on the marches of nowhere, trying to make ellipses out of spirals without recourse to the Calculator. He looked up as Amalfi and the girl entered.

"Hello," he said, dismally, "Amalfi, I really need some help here. How can a man work without facts? If only you'd turn the City Fathers back on—"

"Shortly. How long has it been since you looked back the way we came, Jake?"

"Not since we started across the Rift. Why, should I have? The Rift is just a scratch in a saucer; you need real distance to work on basic problems."

"I know that. But let's take a look. I have an idea that we're not as alone in the Rift as we thought."

Resignedly, Jake went to his control desk and thumbed buttons. "What do you expect to find?" he demanded, his voice petulant. "A haze of iron filings, or a stray meson? Or a fleet of police cruisers?"

"Well," Amalfi said, pointing to the screen, "those aren't wine bottles."

The police cruisers, so close that

the light of He's sun twinkled on their sides, shot across the screen in a brilliant stream, long tails of false photons striping the Rift behind them.

"So they aren't," Jake said, not much interested. "Now may I have my 'scope back, Amalfi?"

Amalfi only grinned. Cops or no cops, he felt young again.

Hazleton was mud up to the thighs. Long ribands of it trailed behind him as he hurtled up the lift shaft to the control tower. Amalfi watched him coming, noting the set whiteness of the city manager's face as he looked up at Amalfi's bending head.

"What's this about cops?" Hazleton demanded while still in flight. "The message didn't get to me straight. We were raided, all hell's broken loose everywhere. I nearly didn't get here straight myself." He sprang into the chamber, his boots shedding gummy clods.

"I saw the fighting. Looks like the Moving Day rumor reached the 'stiffs, all right."

"Sure. What's this about cops?"

"The cops are here. They're coming in from the northwest quadrant, already off overdrive, and should be here day after tomorrow."

"Surely they're not after us," Hazleton said. "And I can't see why they should come all this distance after the 'stiffs. They must have had to use deep-sleep to make it. And we didn't say anything about the no-

fuel drive in our alarm 'cast—"

"We didn't have to," Amalfi said. "Some day I must tell you the parable of the diseased bee—as soon as I figure out what a bee is. In the meantime things are breaking fast. We have to keep an eye on everything, and be able to jump in any direction no matter which item on the agenda comes up first. How bad is the fighting?"

"Very bad. At least five of the local bandit towns are in on it, including Fabr-Suithe, of course. Two of them mount heavy stuff, about contemporary with the Hruntan Empire in its heyday . . . ah, I see you know that already. Well, it's supposed to be a holy war on us. We're meddling with the jungle and interfering with their chances for salvation-through-suffering, or something—I didn't stop to dispute the point."

"That's bad; it will convince some of the civilized towns, too—I doubt that Fabr-Suithe really believes the religious line, they've thrown all that overboard, but it makes wonderful propaganda."

"You're right there. Only a few of the civilized towns, the ones that have been helping us from the beginning, are putting up a stiff fight. Almost everyone else, on both sides, is sitting it out waiting for us to cut each other's throat. Our handicap is that we lack mobility. If we could persuade all the civilized towns to come in on our side we wouldn't need it, but so many of them are scared."

BINDLESTIFF

"The enemy lacks mobility, too, until the bindlestiff is ready to take a direct hand," Amalfi said thoughtfully. "Have you seen any signs that the tramps are in on the fighting?"

"Not yet. But it can't be long now. And we don't even know where they are!"

"They'll be forced to locate themselves today or tomorrow, I'm certain. Right now I want you to muster all the rehabilitated women we have on hand and get ready to spring your scheme. As soon as I get a fix on the bindlestiff I'll locate the nearest participating bandit town, and you can do the rest."

Hazleton's eyes, very weary until now, began to glister with amusement. "And how about Moving Day?" he said. "You know, of course—you know everything—that not one of your stress-fluid plugs is going to hold with the work this incomplete."

"I'm counting on it," Amalfi said tranquilly. "We'll spin when the time comes. If a few plugs spring high, wide, and tall, I won't weep."

"How—"

The Dinwiddie Watch blipped sharply, and both men turned to look at the screen. There was a fountain of green dots on it. Hazleton took three quick steps and turned on the co-ordinates, which he had had readjusted to the butterfly grid.

"Well, where are they?" Amalfi demanded.

"Right smack in the middle of the southwestern continent, in that vine-jungle where the little chigger-

snakes nest—the ones that burrow under your fingernails. There's supposed to be a lake of boiling mud on that spot."

"There probably is—they could be under it with a medium-light screen."

"All right, we've got them placed—but what are they shooting up?"

"Mines, I suspect," Amalfi said.

"That's dandy," Hazleton said bitterly. "They'll leave an escape lane for themselves, of course, but we'll never be able to find it. They've got us under a plutonium umbrella, Amalfi."

"We'll get out. Go plant your women, Mark. And—put some clothes on 'em first. They'll make more of a show that way."

"You bet they will," the city manager said feelingly. He went out.

Amalfi went out on the balcony. At moments of crisis, his old predilection for seeing and hearing and breathing the conflict, with his senses unfiltered and unheightened by any instruments, became too strong to resist. There was good reason for the drive, for that matter; for excitement of the everyday senses had long ago been shown to bring his orientation-sense to its best pitch.

From the balcony of City Hall, most of the northwest quadrant of the perimeter was visible. There was plenty of battle noises rattling the garish tropical sunset there, and even an occasional tiny toppling figure. The city had adopted the local dodge of clearing and gelling the

mud at its rim, and had returned the gel to the morass state at the first sign of attack; but the jungle men had broad skis, of some metal no Hevian could have fashioned so precisely. Disks of red fire marked bursting TDX shells, scything the air like death's own winnows. No gas was in evidence, but Amalfi knew that there would be gas before long.

The city's retaliatory fire was largely invisible, since it emerged below the top of the perimeter. There was a Bethé fender out, which would keep the wall from being scaled—until one of the projectors was knocked out; and plenty of heavy rifles were being kept hot. But the city had never been designed for warfare, and many of its most efficient destroyers had their noses buried in the earth, since their intended functions was only to clear a landing area. Using an out-and-out Bethé blaster was, of course, impossible where there was an adjacent planetary mass.

He sniffed the scarlet edges of the struggle appraisingly. Under his fingers on the balcony railing were three buttons, which he had had placed there four hundred years ago. They had set in motion different things at different times. But each time, they had represented choices of action which he would have to make when the pinch came; he had never had reason to have a fourth button installed.

Rockets screamed overhead.

ASTOUNDING SCIENCE-FICTION

Bombs followed, crepitating bursts of noise and smoke and flying metal. He did not look up; the very mild spindizzy screen would fend off anything moving that rapidly. Only slow-moving objects, like men, could sidle through a polarized gravity field. He looked out to the horizon, touching the buttons very delicately.

Suddenly the sunset snuffed itself out. Amalfi, who had never seen a tropical sunset before coming to He, felt a vague alarm, but as far as he could see the abrupt darkness was natural, if startling. The fighting went on, the flying disks of TDX much more lurid now against the blackness.

After a while there was a dogfight far aloft, identifiable mostly by traceries of jet trails and missiles. The jungle jammed derision and fury without any letup.

Amalfi stood, his senses reaching out slowly, feeling the position of things. It was hard work, for he had never tried to grasp a situation at such close quarters before, and the trajectory of every shell tried to capture his attention.

About an hour past midnight, at the height of the heaviest raid yet, he felt a touch at his elbow.

"Boss—"

Amalfi heard the word as if it had been uttered at the bottom of the Rift. The still-ascending fountain of space mines had just been touched, and he was trying to reach the top of it; somewhere up there the trumpet flattened into a shell

encompassing the whole of He; and it was important to know how high up that network of orbits began.

But the utter exhaustion of the voice touched something deeper. He said, "Yes, Mark."

"It's done. We lost almost everybody. But we caused a very nice riot." A ghost of animation stirred in the voice for a moment. "You should have been there."

"I'm—almost there now. Good . . . work, Mark. Get . . . some rest."

"Sure. But—"

Something very heavy described a searing hyperbola in Amalfi's mind, and then the whole city was a scramble of magnesium-white and ink. As the light faded, there was a formless spreading and crawling, utterly beyond any detection but Amalfi's.

"Gas alarm, Mark," he heard himself saying. "Hawkesite . . . barium suits for everybody."

"Yes. Right. Boss, you'll kill yourself running things this way."

Amalfi found that he could not answer. He had found the town where the women had been dropped. Nothing clear came through, but there was certainly a riot there, and it was not entirely within the town itself. Tendrils of movement were being turned back from the Okie city, and were weaving out from places where there had been no sign of activity before.

At the base of the mine fountain, something else new was happening. A mass rose slowly, and there was a

thick flowing around it. Then it stopped, and there was a sense of doors opening, heavy potentials moving out into tangled desolation. The tramps were leaving their city. The unmistakable, slightly nauseating sensation of a spindizzy field under medium drive domed the boiling of the lake of mud.

Dawn coming now. The riot in the town where the women were still would not come clear, but it was getting worse rather than better. Abruptly there was no town there at all, but a boiling, mushrooming pillar of radioactive gas—the place had been bombed. The struggle moved back toward the area of tension that marked the location of the bindlestiff.

Amalfi's own city was shrouded in sick orange mist, lit with flashes of no-color. The gas could not pass the spindizzy screen in a body, but it diffused through, molecule by heavy molecule. He realized suddenly that he had not heeded his own gas warning, and that there was probably some harm coming to him; but he could not localize it. He moved slightly, and instantly felt himself incased. What—

Barium paste. Hazleton had known that Amalfi could not leave the balcony, and evidently had plastered him with the stuff in default of trying to get a suit on him. Even his eyes were covered, and a feeling of distension in his nostrils bespoke a Kolman respirator.

The emotional and gravitic ten-

sions in the bindlestiff city continued to gather; it would soon be unbearable. Above, just outside the space mines, the first few police vessels were sidling in cautiously. The war in the jungle had already fallen into meaninglessness. The abduction of the women from the Hevian town by the tramps had collapsed all Hevian rivalry; bandits and civilized towns alike were bent now upon nothing but the destruction of Fabr-Suite and its allies. Fabr-Suite could hold them off for a long time, but it was clearly time for the bindlestiff to leave—time for it to make off with its women and its anti-agapics and its germanium, time for it to lose itself in the Rift before the Earth police could invest all of He.

The tension knotted suddenly, painfully, and rose away from the boiling mud. The stiff was taking off. Amalfi pressed the button—the only one, this time, that had been connected to anything.

Moving Day began.

V.

It began with six pillars of glaring white, forty miles in diameter, that burst through the soft soil at every compass point of He. Fabr-Suite had sat directly over the site of one of them. The bandit town was nothing but a flake of ash in a split second, a curled flake borne aloft on the top of a white-hot piston.

The pillars lunged roaring into the

heavens, fifty, a hundred, two hundred miles, and burst at their tops ^{“up”} popcorn. The sky burned thermite-blue with steel meteors. Outside, the space mines, cut off from the world of which they had been satellites by the greatest spindizzy screen of all time, fled into the Rift.

And when the meteors had burned away, the sun was growing.

The world of He was on overdrive, its magnetic moment transformed, expressed as momentum; it was the biggest city ever flown. There was no time to feel alarm. The sun flashed by and was dwindling to a point before the fact could be grasped. It was gone. The far wall of the Rift began to swell, and separate into individual points of light.

Appalled, Amalfi fought to grasp the scale of speed. He failed. The planet of He was moving, that was all he could comprehend; its speed gulped light-years like gnats. Even to think of controlling so stupendous a flight was ridiculous.

Stars began to wink past He like fireflies. Then they were all behind.

The surface of the saucer that was the galaxy receded.

“Boss, we’re going out of the—”

“I know it. Get me a fix on the Hevian sun before it’s too late.”

Hazleton worked feverishly. It took him only three minutes; but during those three minutes, the massed stars receded far enough so that the gray scar of the Rift became plain, as a definite mark on a

spangled ground. The Hevian sun was less than an atom in it.

“Got it. But we can’t swing the planet back. It’ll take us two thousand years to cross to the next galaxy. We’ll have to abandon He, boss, or we’re sunk.”

“All right. Get us aloft. Full drive.”

“Our contract—”

“Fulfilled—take my word for it. Spin!”

The city screamed and sprang aloft. The planet of He did not dwindle—it simply vanished, snuffed out in the intergalactic gap. It was the first of the pioneers.

Amalfi took the controls, the barium casing cracking and falling away from him as he moved. The air still stank of Hawkesite, but the concentration of the gas already had been taken down below the harmful level by the city’s purifiers. The mayor began to edge the city away from the vector of He’s movement and the city’s own, back toward the home lens.

Hazleton stirred restlessly.

“Your conscience bothering you, Mark?”

“Maybe,” Hazleton said. “Is there some escape clause in our contract that lets us run off like this? If there is I missed it, and I read the fine print pretty closely.”

“No, no escape clause,” Amalfi said, shifting the space stick delicately. “The Hevians won’t be hurt. The spindizzy screen will protect them from loss of heat and atmos-

sphere—their volcanoes will supply more heat than they'll need, and their technology is up to artificial UV generation. But they won't be able to put out enough UV to keep the jungle alive. By the time they reach the Andromedan star that suits them, they'll understand the spindizzy principle well enough to set up a proper orbit. Or maybe they'll like roaming better by then, and decide to be an Okie planet. Either way, we did what we promised to do, fair and square."

"We didn't get paid," the city manager pointed out. "And it'll take our last reserves to get back to any part of our own galaxy. The bindle-stiff got off, and got carried 'way out of range of the cops in the process—with plenty of dough, women, everything."

"No, they didn't," Amalfi said. "They blew up the moment we moved He."

"All right," Hazleton said resignedly. "You could detect that; I'll take your word for it. But you'd better be able to explain it."

"It's not hard to explain. The 'stiffs had captured Dr. Beetle. I was pretty sure they would. They came to He for no other reason. They needed the fuelless drive, and they knew Dr. Beetle had it, because of the agronomist's SOS. So they snatched him when he landed—notice how they made a big fuss about the *other* agronomist life ship, to divert our attention?—and worked the secret out of him."

"So?"

"So," Amalfi said, "they forgot that any Okie city always has passengers like Dr. Beetle—people with big ideas only partially worked out, ideas that need the finishing touches that can only be provided by some other culture. After all, a man doesn't take passage on an Okie city unless he's a third-rate sort of person, hoping to make his everlasting fortune on some planet where the people know less than he does."

Hazleton scratched his head ruefully. "That's right. We had the same experience with the Lyran invisibility machine. It didn't work, until we took that Hruntan physicist on board; he had the necessary extra knowledge—but he couldn't have discovered the principle himself, either."

"Exactly. The 'stiffs were in too much of a hurry. They didn't carry their stolen fuelless drive with them until they found some culture which could perfect it. They tried to use it right away—they were lazy. And they tried to use it inside the biggest spindizzy field ever generated. It blew up. If we hadn't left them parsecs behind in a split second, it would have blown up He at the same time."

Hazleton sighed and began to plot the probable point at which the city would return to its own galaxy. It turned out to be a long way away from the Rift, in an area that, after a mental wrench to visualize it backwards from the usual orientation,

promised a fair population.

"Look," he said, "we'll hit about where the last few waves of the Acolytes settled—remember the Night of Hadjiji?"

Amalfi didn't, since he hadn't been born then, nor had Hazleton; but he remembered the history, which was what the city manager had meant. With a sidelong glance, he leaned forward, resumed the helmet he had cast aside a year ago, and turned on the City Fathers.

The helmet phone shrilled with alarm. "All right, all right," he growled. "What is it?"

"MAYOR AMALFI, HAVE YOU TIPPED THIS PLANET?"

"No," Amalfi said. "We sent it on its way as it was."

There was a short silence, hum-

ming with computation. "VERY WELL. WE MUST NOW SELECT THE POINT AT WHICH WE LEAVE THE RIFT. STAND BY FOR DETERMINATION."

Amalfi and Hazleton grinned at each other. Amalfi said, "We're coming in on the last Acolyte stars. Give us a determination for the present setup there, please—"

"YOU ARE MISTAKEN. THAT AREA IS NOWHERE NEAR THE RIFT. WE WILL GIVE YOU A DETERMINATION FOR THE FAR RIFT WALL: STAND BY."

Amalfi removed the headset gently.

"That," he said, moving the phone away from his mouth, "was long ago—and far away."

THE END.



Courtesy: General Electric Aircraft Turbine Division

THE CURFEW TOLLS

It was Judgment Day coming up — a very real and physical Judgment Day, as the Aliens helped Earth clean house. And if it came tomorrow, and your name contained an O and an S . . .

The man wearing the green felt hat and shapeless, stained raincoat shouldered open the swing doors of the Coster Building and drew a straight line to the reception desk.

"I want to see Mr. Coster," he said quietly.

The girl smiling professionally and inquiringly substituted a smile of polite regret and said: "I'm sorry, sir, Mr. Coster sees only—"

"My name is Raymond Stone," said the man in the same quiet tone. He did not so much interrupt the girl as interpolate the name gently in her apology. She stopped smiling and nodded, but Stone was already on his way to the elevator.

He stopped again before the desk that was the farthest outpost of the suite of offices on the tenth floor. "I'd like to see Mr. Coster," he said.

The girl at the desk, who might have been the sister of the girl downstairs, prepared and adopted a similar apologetic manner. Stone waited until she opened her mouth, and

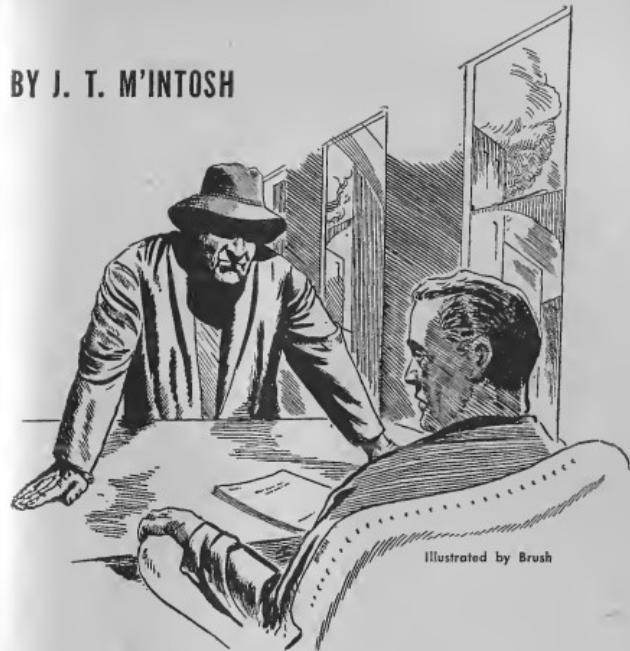
then gave his name again. He did this five times in all, until he stood in the large lushly-carpeted office which was the mind of the building and its activities, looking across thirty feet of space and mahogany desk at a tall gray-haired man who looked up with faint interest as he entered the room.

"I came through the offices," Stone remarked.

"Why? To see people working?"

"No. To see how much what I'm going to tell you matters to you." He accepted a cigarette, lit it and inhaled. He put a lot of work on it. He was small and restless, and his thin intelligent features and sharp darting eyes inferred that he lived by finding opportunities and taking them. "There was no reason why you should have told everyone in the building that if a Mr. Stone called to see you, he was to be shown straight up. No reason unless, perhaps, you were so afraid I wouldn't come that you felt you had to make

BY J. T. M'INTOSH



Illustrated by Brush

sure of seeing me if I as much as showed my head round the door. I thought it might be like that, so I tried the experiment."

"And your fee, no doubt, has mounted accordingly."

"No. But I'm more certain that you'll pay it."

Stone drew the tip of his cigarette into a long glowing warhead. His

voice and choice of words implied education. When he spoke his nondescript clothes took on distinction and he looked clever instead of merely cunning.

"Am I supposed to ask your price?" Coster inquired.

"Twenty thousand dollars."

"Is it worth it?"

Stone smiled. "It all depends on

your point of view," he said. "Twenty thousand is a lot to pay for information which will be everyone's at noon tomorrow—in less than twenty-four hours, in fact. Especially when I tell you, free, that knowing in advance won't benefit you in the least. But then, you must know, mustn't you? And I'm the only man on earth who will tell you."

"All right. Get on with it."

Stone looked at him with faintly amused respect. "You bear it well," he remarked. "You don't scream at me as others I know would. Well, here it is. There's a lot of it, so you'll need more patience yet."

He stubbed out his cigarette as if it and business could not coexist. "I was at the conference of Earth and Myrl representatives today," he said. "You won't believe that, you'll think I bribed some judge or scientist to tell me what went on, but it doesn't matter. I was there from the first tap of the gavel until a hundred Earth men and women and ninety-eight men and women from a planet seven thousand light-years away got up, shook hands in terrestrial style, as a compliment to the home country, I suppose, and chattered their way along the aisles as if they'd been at a theater show. Got the picture? Two of the Myrl men couldn't make it. The others were polite about it but didn't really try to hide their appreciation of the fact that there might easily be more interesting problems to occupy the absenteesthan those of the planet Earth."

"Look," said Coster, "I can be patient, but I think my twenty thousand is worth more than this. I want to know what happened. I want to know now, not when you've gone over the history of the ship's arrival and the demonstrations of Myrl superiority and the two-planet conference and what you had for breakfast."

"I have to give you some of that. The whole first part of the conference was history. Earth's wars, Earth's fear of war and particularly the next one that everyone knows would be the last, Myrl's social science and the reports of the party that visited Myrl, and Earth's appeal for guidance."

Coster nodded, in complete control of himself once more. "The forecasts were right, then."

"Up to Myrl's reply. That wasn't quite what anyone expected—except you."

Coster started. "How do you know what I expected?"

"In a word, you're science, you're big business, and you're scared. Nobody else was scared. It's no question of war with Myrl. It's whether the perfect, friendly Myrlans will help poor, misguided Earth or not. Well, they will—on conditions. That's what you were afraid of, isn't it? They'll help to put Earth right, but Earth will have to do as they say. One of the Myrlans coined an expressive phrase about it. 'It's for your own good,' he said. And point one is that Earth must punish every individual who socially deserves to

be punished. We're to have a Hell of our own here on Earth so that Earth can be Heaven. Simple, isn't it?"

Coster said nothing.

Stone took another cigarette and lit it. "Seventy-nine Earth men and women voted for the Myrlan reform—though most of them knew it meant weeks, maybe years, in Hell for themselves. The human race can be really big after all. But you want to know how it's to be worked. Next Monday the first batch goes before the Myrlan judges. They—"

"Myrlan?"

"How else? The Myrlans can see through us like glass, tot us up and write in the result in two minutes. They'll do just that. Meanwhile they'll be training Earth judges—not the ones we have now, but a new lot selected by them—in telepathy and judgment and punishment. They didn't prove that for society's good all wrongdoing should be punished—they just told us. But they hinted that their ideas of punishment and ours might not coincide for a bit. So maybe you'll find yourself scrubbing floors or licking envelopes yet. But that's your affair. Hell will be set up on the south polar cap—ironic, isn't it, Hell in the coldest place on Earth. The first group—"

He looked at Coster, took pity on him and went on quickly: "It will take a long time to deal with everyone on Earth, of course, and I can't tell you the details because that was left to the Myrlans. But the first group for judgment was decided—a

random selection, of course. You won't have to wait. It's everyone whose name includes one O and one S."

"I knew, somehow," Coster remarked, half to himself. "There's no more you can tell me?"

"I don't think so. The decision will be announced at noon tomorrow as arranged."

Coster opened a drawer in his desk, took something out, scribbled for a moment and handed a check to Stone. "I'll phone the bank," he said. "You'd better go to the head office. They won't make any trouble about paying out the whole sum if you want it. So don't lose that check."

Stone rose. "I won't," he said. For a minute that seemed much longer he stood on the thick carpet staring at Coster. Then he smiled oddly, repeated "I won't," as if to deny that there had been a pause, and went out quietly.

Coster rose from his chair, went into the bathroom that adjoined the office and looked at himself in the mirror. Fifty-one years of—what? He would get his deserts at last. He could not remember when he had first guessed what the results of the visit of the spaceship would be to him. It had come in sections, but long before the conference of leaders from all over the Earth, some of whom had been taken to Myrl to see Myrlan science, art and wisdom in its essence, he had been afraid.

It was not a simple fear, like fear of disfigurement or drowning. It was

a fear like the fear of spiders, of closed rooms, of sharp instruments. He would not die. He knew that as he had known the result of the council even as he sought Stone to spy it out for him. He would be—punished. Treated according to his deserts. The sweat broke on his brow as the phrase passed through his mind. According to his deserts. They would look into his mind and see what no one had ever seen but himself. They would care less than nothing for his wealth, his position, his carefully-guarded reputation. They would see what he was, what he had done and what he had thought, why he had thought and done it.

Before the two-world council met, he had sat all night in his office, wondering if he could turn the scale with his wealth and power. His wife had entertained fabulously while she lived, and many of the world councilors were known to him. He thought of buying their votes, some with money, others with what they wanted; but he gave up the plan because he realized at last with shocking clarity that he could buy only those votes which would be worth nothing, that he would be paying men to vote against a scheme that they would never support in any case. Now that it was over he knew without needing confirmation that the ten or so votes he might have thought he could buy were numbered in the twenty-one who had voted against the Myrlan plan.

He returned to his office. Suddenly, he stood arrested, looking at

the spot where Stone had last stood. Stone—next Monday Stone, too, would be among those with one O and one S in their names awaiting judgment, with all the other Stones and Costers and Carsons and Astons and Williamsonsons and Simons—

It was like Stone, who must have little less to fear than he had himself, to play out the scene and take his money as he had—a scene which could hardly count in his favor on Monday. The Myrlans would know their decree had been flouted when they looked into Stone's mind. Could Myrlans be vindictive? They were human, or very near human; perhaps having eyes, hands, organs, dimensions, senses, affections, passions like Christians, they would also revenge.

Every word spoken at the conference was in every newspaper in the world printed the next day. The news did not break at noon, as Stone had said and as had been arranged, since for once there were no advance copies. It was well after noon when a hastily-prepared summary was read on the radio as press associations sent the news across the world.

Coster missed the release, for he had managed at last, after twelve hours of restlessness, to interest himself in something else. It was an equation that proved a reality where no reality existed, and had been sent to him with a gleeful "Work this one out!" by an old rival. Torsvig knew the flaw, and had offered to sell the information. If all else failed, Coster knew he would have to pay for it.

The equation was only a trick, a self-evident hoax admitted freely by the man who sent it. Coster would bend his whole mind to the problem, but if it was not enough he still had to know, even on Torsvig's terms.

He remembered the Dodgson proof that every triangle was isosceles, but that was to this as kindergarten arithmetic was to calculus. Still, the method—

He found the flaw at last, in an expression that had a concealed irrational solution as well as the real value which was casually accepted, and immediately cursed himself for finding it. While he was playing with figures like a child with bricks he was happy, but when play was over nothing had changed.

Monday came closer by age-long days made up, impossibly, of fleeting hours and imperceptible minutes. He rang up Torsvig and tried to find diversion in simulated amusement at the simplicity of the little problem. But Torsvig was able to laugh—though he, too, had one S and one O in his name. Torsvig was all right, Coster admitted to himself as he hung up. What a great thing it must be for a man when a rival who hated him had to admit he had nothing to fear from an exposure of his whole soul! Had Torsvig's voice even held a hint of pity for him? Coster writhed at the thought.

If it had been a secret horror it would have been more bearable. But everyone knew. Colleagues, friends, employees made jokes, offered reassurance, gloated openly, sent him

letters with black borders. Except Ohlsen, his chief chemist, who helped Coster to bear his burden by being so manifestly apprehensive about his own. But Ohlsen was another who had little to fear. Some men, like Torsvig, had done little harm in the world and knew it; others, like Ohlsen, had done almost as little and were modestly apprehensive. There were the other variations, men like Mason, a lawyer of his acquaintance, who thought themselves the salt of the earth and had an unpleasant shock in store. And, of course, men like Robert Coster, who—

He wondered what would happen to the Coster Building and its work. He had always been a despot; he doubted whether his brainchild could function if he were not there to direct it, even for a short time. There was an answer, and having no time to waste he did not attempt to argue himself out of seeing it. He got Roger Winthrop on the phone.

Winthrop didn't help him out. He said nothing in any of the various pauses which Coster left for comment. At last, as Coster was about to ask if he was still listening, Winthrop's heavy voice came: "It's impossible, Coster. I won't accept any offer you can think of, and I'd have thought you'd know it. I can't do good work unless I believe in what I'm doing, in my staff, small or large, and in the methods. I think you have just enough honesty to understand that. So long."

"Wait!" Coster exclaimed. "Haven't you been listening? Didn't

you hear me offer you complete control—on your own terms?"

There was an incredulous pause. Then Winthrop's voice again. "What's the matter, has your doctor stopped you working, or something?"

Winthrop had apparently forgotten the Myrlans and their ultimatum. There were some people like that, people who had clear consciences or who were able to ignore what did not immediately concern them.

Coster would probably have said a few weeks since that he would rather drop an atom bomb on the Coster Building than let Winthrop run it. But he knew Winthrop would keep the center alive; he might change its character, but not its purpose, so he was the man for the job.

When it was settled Coster could think of nothing else he could do. A line ran through his mind, seeming to coil itself among the cells: "I am the master of my fate, the captain of my soul." It was too late to apply that to himself. I was once the master of my fate, he thought.

The Myrlans knew the value of show, as they knew everything else, and the building they used for Judgment, a former department store, had been transformed into a palace of mirrors, subdued lighting, subtle decoration and silence. Fifty centers for Judgment had been set up on Earth; some men and women had to travel hundreds of miles for the Judgment they did not want, some, like Coster, only a few hundred

yards. There would be few absentees, for the Myrlans had already demonstrated the methods that were in operation on their own planet. No register was necessary. Everyone whose baptismal surname, or in the case of married women, whose adopted name, contained one S and one O, had been called. Thus every family attended en bloc. Concealment in any form was futile, for the Myrlans could read any mind, anywhere. It was not Myrlans, but the Earth authorities, who brought shirkers to justice; but the Myrlans informed the authorities who and where they were.

Coster was one of the first hundred, all over the Earth, to be examined. He was led by a policeman to the room where the Myrlan Tron sat in judgment. He wanted to laugh when he saw the familiar uniform in the bizarre surroundings.

Tron sat comfortably in an armchair and waved him to a similar one facing him. There was informality, but there was no reassurance. Earthmen could feel a Myrlan's presence so that there was no need for devices to awe. The presence itself was awe enough.

"It is strange," Tron admitted sibilantly, in answer to a comment which Coster had not voiced, "that we should be your masters and yet your servants. But it is not new. Every time in your own history that a greater race came into contact with a lesser, the meting out of justice passed to the conquerors. Not by conquest, but by nature. Sometimes

the stronger race imposed its will in the matter; but as often the weaker race demanded justice as by right."

Coster was silent, trying futilely to mask his thoughts and his memories. He felt Tron in his mind, touching here and there, never resting.

"Some day Earthmen will be our equals," Tron went on. "One of the fallacies in your present conception of psychology is that intelligence cannot be increased by training. It can. You, Robert Coster, might have been born a Myrlan with the identical brain you had at birth on Earth. You would not have been considered backward. What makes a race great is the knowledge of greatness, and it can be taught that knowledge."

Coster thought he knew why the Myrlan was talking as he did. While he talked, the probing went on. He talked as doctors sometimes do as they work on a patient, occupying the mind as they examine the body. But Tron was occupying the mind as he examined the soul.

"You have misused your brain, of course," Tron went on casually. "Not all of your mistakes were your fault, but many of them were. It is not news to you that in respect of intelligence you are in the top decile of that section. And in the top decile of that. You had no right to make mistakes. You had no right to believe what was not true. Possession of such a mind meant that you had no right to trust the conclusion of others."

"Judgment is over. You will be sent to Myrl for five years."

"To Myrl? But—"

"I see all the fear, all the anger in your mind. You thought there was no question of removal from Earth. You think I am exceeding my rights. Calm yourself. Behave as one of your mentality should behave. You will work with Myrlans as a pupil at first and then, perhaps, as an assistant. If your mind retains sufficient resiliency, you may even work with them as an equal. You will not refuse the opportunity, which is not to Myrl's benefit, but to Earth's, because you are what you are. In theory, even in practice, you need not go if you do not wish to go. We are forcing nothing on Earth. But when you hear more of this, as you will in a short time, it will not occur to you to refuse. You will, incidentally, be given fifty more years of life to be of service to Earth—and perhaps, who knows, to Myrl."

Coster stared at him and suddenly laughed. "This is your Judgment?" he said. "But I thought—"

"That it was set up to punish those who deserved punishment? It was. In some ways, Robert Coster, with all your fine brain, you are a little child. Even now you are trying to find explanations for my attitude other than the one you have refused to believe."

"Robert Coster, you are a good man. You have had to fight, and when there is fighting someone must be hurt. Because you have

never been the one, you have believed yourself worthy of punishment. That is faulty reasoning of which you should be ashamed.

"You have discarded men as you have discarded ideas, because you needed better ones. On this account you thought yourself hard, even though you helped the men you could no longer use. Blaming yourself was sophistry, Robert Coster, and you should have known better.

"You feel you have worked, as a scientist, for evil as well as good. Robert Coster, do you not know that a man can kill his fellow with a piece of beautiful statuary, the manuscript of a masterpiece, a musical instrument, a piece of silk, a child's toy, a garden rake, a length of insulated wire? In any civilization, Earth's as much as Myrl's, there is creation, and all creation is either Art or Science. The artist knows he is not concerned with pointing a moral purpose — why should the scientist be concerned with the effects of his work? He must meddle, or he will never know, and if he never knows he will not have fulfilled his purpose.

"Every man can be added up, as I have added you up. You would have had to accept my verdict had I declared you a criminal to hu-

manity. You must instead accept my verdict that you are one of Earth's leaders, whether you wish to be or not—a strong man, a wise man, and a good man. Now go. I have less pleasant duties to perform."

Coster's heart should have been singing as he went out into the street again. Tron had carried conviction, as he would to the others he assessed very differently. These Myrlans were gods on Earth—more personal, less omnipotent than the gods of theology, but gods, all-knowing, all-seeing, with whose verdict there was no argument. It might have seemed a terrible thing that they should come to Earth. But it was no horror to be, one day, as the Myrlans were—gods, but still human.

Coster had no clear thoughts, however, just at the moment. His mind was still wrestling with the idea that he had been weighed in the balance and not found wanting. For the last time the possibility of questioning the rightness of Tron and all things Myrlan occurred to him, was examined fairly, in so far as he found it possible, and then cast aside forever. One might as well doubt nature as doubt a Myrlan.

THE END

ASTOUNDING SCIENCE-FICTION

COMPROMISE

BY H. B. FYFE

The Department of Dirty Tricks was not exactly an easy place for outsiders to enter; they specialized in outguessing the other fellow. And sometimes it's extremely smart to be stupid — in the right way.

Illustrated by Cartier

The light in the office was uniformly diffused and too bright for the single fixture in the center of the ceiling. Its warm glow shimmered on the satiny panels of the walls.

Beside the door in the west wall hung a large picture. Similar scenes of the city outside were placed above the row of five filing cabinets along the south wall, over the bookcase and iridescent green leather sofa opposite them; and behind the desk that slantingly faced the entrance. A chair with a caressing shape was placed before the desk, halfway between the entrance and a door beyond the bookcase which led to the lavatory. A smaller chair stood at the end of the files.

"There he is," said the tech's voice over the desk visor.

At the moment, the picture be-

side the door was dimmed behind a superimposed view of the anteroom leading to the main hall. It showed a lean-faced, rather ugly man whose thin, lank, black hair was brushed carelessly back from his brow.

Sitting behind the desk, regarding the disguised visiscreen with some distaste, was a handsome man whose deep crimson jacket and gleaming black slacks bordered upon the foppish. Wavy yellow hair was matched by a neat mustache that suited his cheerfully bland features. Something about him—possibly the chill of the blue eyes—suggested that most of his apparent plumpness was underlaid with muscle.

"I don't like the looks of him," he murmured. "How did he get this far?"

"Security is still checking, Mr.

Fuller," answered the tech. "He showed an appointment pass on this floor, but they dunno yet where he got it or how he slipped in the building."

"Have one of them hustle up here and find out," ordered the blond man. "I don't especially care to be diddled today."

"Yes, sir. Want some of us to come in from the labs?"

"No, send for the Security boys. Meanwhile, have a couple of scanners put on him!"

He leaned back, considering the procedure he had set in motion. To his left rear, beyond the filing cabinets and the private hall on the other side of the wall, were the two laboratories the Bureau of Special Trading allowed him. Another hall ran along the opposite side of his office. Both halls opened into chambers flanking the anteroom.

In a moment, his techs would be projecting subtle radiations through that anteroom and its occupant, and he would learn something of what was under the baggy blue jacket and slacks. He was inclined to suspect a weapon. In his task of seeing to it that out-system traders from neighboring stars should find Terra a pleasant bargain center, Fuller had occasionally been forced to break eggs for his omelets.

"But I never saw *him* before," he mused.

The man in the anteroom had risen and was pacing rather awkwardly about on the springy floor covering. He looked preoccupied. He

did not pause, as did most visitors, to examine the stellar wall map of bright plastic that concealed a scanner.

Usually, Fuller remembered, Terrans showed satisfaction at the commanding position of their sun between civilizations toward the Edge of the galaxy and those nearer the Center. Out-system visitors sometimes sought in vain for some obscure star the B. S. T. did not desire to advertise.

This man, however, showed no reaction at all.

A low, surprised whistle sounded from the desk visor.

"They getting something?" inquired Fuller.

"I'll cut you in on the north wall," said the tech.

The sunlit towers above the leather sofa faded. They were replaced by a subsurface close-up of the caller, originally caught on a screen in one flanking chamber from radiation projected through the anteroom. It told an interesting story.

"I thought by that fried expression he wasn't human!" said Fuller. "That's a good job on the skin and flesh. Mostly rubber or plastic, I suppose."

"They're trying to scan through the metal sheath underneath," reported the tech.

"Is Security sending someone?"

"Several," answered the other succinctly.

Fuller considered whether he



should remain in the office. A disguise like the one beyond the door had seldom, in his experience, indicated amity. By sliding back two of the filing cabinets, he could step into the private hallway. Concealed doors there would admit him into either lab, or he could walk out into the rear corridor.

Or he might take a few steps to his right rear and slip through a moving panel beside the "picture" there into a very private office. There was no exit near the sofa or bookcase, the area farthest from his chair, unless he went through the side wall of the lavatory.

"They're getting something!" reported the tech.

The translucent image over the bookcase shimmered and something

inside the "man" in the anteroom.

Two limbs ran down the flexible metal sheaths inside the legs, but two more were folded into what had seemed a paunchy abdomen. The arms of the dummy were operated by nonhuman tentacles within them, and the rest of the alien was squeezed into the trunk. The head held various mechanisms, probably including a periscope. Nestled in the midriff was a dark blot.

"He looks like a Pyllmarian to me," said Fuller. "Have them find out what he's carrying in there!"

"Yes sir. They have scanners set to track him now, even if you let him in."

"I've a good mind not to—" He broke off. "Too late! He's coming to call. Get slick with those screens!"

The pictures became pictures once more, an instant before the door opened. Fuller leaned over some papers on the desk.

"Oh? I'm sorry! Were you waiting to see me?"

"Perhaps I was not announced. May I enter?"

"Of course," replied the B. S. T. man, gesturing hospitably toward the caressing chair. He left his desk visor on; it was directionalized in both sight and sound.

They did very well with that voice, he thought. *You'd have to listen very closely to the tones.*

The visitor strode to the chair across an even more cushiony floor than that of the anteroom. He was noticeably clumsy in reaching his goal, not to mention folding himself into it.

Seated, he turned expressionless eyes upon Fuller.

"Security men on the way," reported the visor discreetly. "Our techs want to use the side passages to keep on him."

"Excuse me," said Fuller with a polite smile.

He reached out to the visor as if to punch one of the row of buttons before it, but actually did nothing.

"I'll O.K. the second of those," he said, quite openly.

The visitor was watching him alertly when he looked up.

"Routine matters," Fuller shrugged. "If we want a copy of some report, we choose it as it's flashed on the screen. Better than

sending copies around to be initialed."

"Convenient," agreed the other laconically.

"And now—may I be of service to you?"

"I doubt it very much."

The statement was coldly emotionless. Worse, it suggested that the Pyllmarians had nothing to lose by revealing himself.

As if he has reached his goal, thought Fuller. He tried to recall dealing with Pyllmarians. As he remembered, they had a planetary system about twenty light-years from Sol. Was it they who used to export expensive lizard skins in crates of thin platinum?

"I have been chosen by my people," continued the visitor, "to expunge a folly committed about three of your years ago."

Yes, thought Fuller, it's the matter of the platinum boxes. I told Butler we should have given them something!

Aloud, he said, "I'll gladly do what I can, Mr.—?"

"Rawu. You know very well I am not Terran. I am from Pyllmar."

"How should I have known?" asked Fuller, actually surprised.

"Having made a study of Terran facial expressions, I note that you have been scrutinizing me intently. I would not underestimate your resources. There are flaws in my disguise."

"It's really very good," Fuller complimented him frankly. "But you appeared here unscheduled."

Rawu hesitated. With chagrin, Fuller wondered?

"Correct," the Pyllmarian agreed at last. "You Terrans are creatures of habit and routine."

He seemed satisfied to leave it at that. Fuller restrained himself with an effort from squirming in his chair. Finally, he was forced to break the silence.

"Now that we have disposed of that, what can I do for you?"

"Nothing, I think."

"Nothing? Then why are you here?"

"I shall kill you."

Fuller leaned back at the dispassionate flatness of the statement. Alerted for something like it, he was reasonably sure that his expression remained bland. He hoped his techs were getting it all through the scanner in the ceiling light.

"Why?" he asked calmly.

"A matter of some valuable metal," said the other. "To us, they were useless containers. You should have told us."

"The Bureau is always anxious to avoid misunderstandings with its guests. If you will tell me what amount—"

"Too late! Pyllmarians dislike intensely to be made fools. We will be satisfied only with your bones!"

Fuller frowned. Rawu seemed to reconsider.

"I apologize," he said. "I believe the proper expression is 'your blood'. It was *something anatomical*."

To eliminate all confusion, one of the hands fumbled in a pocket of the

baggy blue jacket and produced a dart pistol. Fuller pictured a dozen or so of the poisoned needles plunking into line across his chest. Where were the Security men?

"Forgive my curiosity," he pleaded, "but have you planned on getting yourself out of here afterward?"

"It could hardly be more difficult than getting in!"

Fuller thought he heard a stealthy sound in the anteroom.

"I fear that it may," he said. "Perhaps even impossible."

Rawu was silent. *Slow-thinking worm*, decided Fuller. But the Pyllmarian's next words reminded him of the dark blot in the dummy's midriff.

"I said I did not underestimate you, Terran. If my actions are impeded, I shall destroy the entire chamber, including us!"

With a peremptory knock, the door was flung open to reveal a hard-faced man in uniform. Others crowded behind him, armed.

"What is it, sergeant?" asked Fuller mildly.

The noncom permitted his eyes to flick to the "J. Gilbert Fuller" lettered on the door, then stared sidelong at the Pyllmarian. The dart pistol had disappeared.

"I understand you sent for us, sir," he said.

"I?" Fuller, playing his hunch to the hilt, was blandly innocent. "Someone is mistaken. There is no need for you here."

He smiled pleasantly, gratified to see that the sergeant was not de-

ceived. Stranger things than armed guests occurred at the Bureau of Special Trading. It was well-known among the personnel that a resort to force could often be untimely.

The noncom scrutinized Rawu lingeringly, but withdrew his men.

Fuller cursed to himself at his handicap. Rawu must have relaxed internally but that, of course, was invisible.

"Perhaps I did underestimate you slightly," admitted Rawu.

"I doubt it," smiled Fuller. "I'm a very poor liar. He did not quite believe me."

"But he departed."

"I wonder how far?" Fuller murmured, lowering his glance.

The tech in the desk visor was holding up a scribbled note on the bomb nestled in the Pyllmarian's grasp. His eyes looked darker than usual because his face had gone white.

I wonder if mine has too, Fuller thought.

If that shadowy blot should be activated, he and Rawu would be spread over the paneling like butter on hot toast. The techs behind the scenes would catch a fatal dose of radiation, and even the agents in adjoining suites would not be safe.

"Perhaps," suggested Rawu, "it would be best if you issued me credentials that would expedite my departure."

Fuller grinned broadly at him—at considerable cost to his nervous system.

"I might add," Rawu said, "that I have worn this uncomfortable affair for some time, and am eager to be free."

He gestured very slightly with the dart pistol.

"What do you look at on your desk?" he demanded suddenly.

"The flow of routine items is continuous," said Fuller, staring his tech in the eye. "You may look, if you like."

Rawu rose as slowly moving lines of type appeared.

"I would like," he said. "I shall need your place."

"It can be turned to face you."

Fuller was as reluctant to leave his desk as a spider to lose contact with its web. Within reach of visor and push buttons, he had a certain control of the situation.

"I insist," said Rawu, seeming to sense this.

Fuller rose reluctantly, groping for some excuse, but the dart pistol silenced him. Rawu warily kept his distance until the B. S. T. man had backed against the filing cabinets. He took time to open the door to the lavatory for a hasty glance.

If any tech had been listening there, he had been slick enough to remove himself in time. Fuller sighed with relief.

Rawu sidled behind the desk and directed his host to walk slowly past the entrance to the green leather sofa.

"I am pleased you did not run through the door," he remarked, taking Fuller's chair. "Imagine what

would have happened!"

Fuller said nothing. Behind Rawu's left shoulder, the "picture" above the files now showed two Terrans. One was dark and wolfish, the other brown-haired and stolid. He recognized Lavarro and Henshaw, agents from adjacent suites. His techs must have called them in. The image of the two men dissolved into a hasty sketch of the office layout, showing that every conceivable exit was now heavily guarded.

Really locking the fox in the chicken coop, he thought.

Rawu was inspecting the devices on the desk.

"Forgive my rudeness," he said, with a sarcasm that was the more irritating because his artificial voice did not change tone, "but do any of these permit us to be overheard?"

"Not at the moment."

Fuller felt that he had never lied in a more honest manner, but the Pyllarian remained suspicious. He clicked one of the switches. The overhead light went out, but the room was still lighted by the glow from the wall panels.

Fuller cursed his luck. Now the techs could not see him if he should have to move, although someone would quickly enough be slapping a listening device against one of the walls.

Rawu fiddled a bit more. The light emanating from the wall panels took on a greenish cast, then changed to dim blue.

"Much more pleasant," commented the Pyllmarian.

"If you keep at it," said Fuller, bitter at having his pet secrets on the verge of discovery, "you may cause an accident."

"I intend to," said Rawu grimly. "You are right, however. I desire it to happen in my own time and manner."

Fuller wondered what his brother agents were up to. It was no use rushing a squad in to overpower Rawu. He could set off the bomb before they got inside the dummy.

They could pump anaesthetic through the ventilators, but what if it did not reach Rawu? Fuller did not mind being put to sleep, but not if the other were protected by his disguise.

"What is in here?" asked Rawu, indicating the files.

Fuller shrugged silently.

"Secrets? Perhaps I should take a few with me."

"Want me to pick out some good ones for you?"

"I shall choose them myself."

"So," said Fuller, "you've decided to try escaping?"

"Perhaps. Publicizing some of these records might be quite embarrassing to your Bureau."

This is ridiculous, thought Fuller. *Here I sit in my own nest with a million trigger fingers outside aching for a crack at this worm—and nobody can move! Is he kidding about going? But if I call his bluff, I might be lighting the fuse too soon!*

He felt a moment of doubt. Suppose the busy groups he imagined

tiptoeing about the hidden hallways, insulating his office in widening circles of preparation, were just wishful thinking! He had certainly never felt more alone.

But he had seen Lavarro and Henshaw. And he had received messages as long as his techs could see which screens were safe to use. The whole floor must be bustling like an ant hill.

It had better be, he thought, or I'll end as ant food.

Rawu hesitated before the files. Fuller considered offering to open some of them. It would bring him within range of his desk visor and show his position. Scanners might be tracking the Pyllmarian, but if someone should find how to hurl a bolt of lightning through the room, Fuller wanted to be in the clear.

Rawu settled the problem by plodding back to the desk and folding his dummy body into the chair. As he began again to inspect Fuller's gadgets, the door opened without warning.

"Oh! Sorry," said Henshaw. He flourished some papers at Rawu. "You don't mind, do you? I'll just take a second."

Not waiting for an answer, he turned to Fuller.

"Didn't you have something to do with some Pyllmar deal once? Thought so! That makes you the expert for this."

Rawu moved slightly as the agent started to hand the folder to Fuller. The latter stiffened.

"Just drop it on my desk, will

you?" he requested.

"Sure. The Marketing Department has to scrape up some stuff they think can be got on Pyllmar, whatever that is. They'll pay through the nose for it, but they want your opinion first."

He tossed the papers on the desk, under Rawu's nose.

Fuller shrugged imperceptibly. It might work. There was more than one way of proffering a bribe.

Reaching the door unhindered, Henshaw paused.

"Let me know if you think we should go into it," he said.

Fuller, concentrating on every tone and gesture, thought there had been a slight emphasis on the last three words. *Go into it—* How did Henshaw think he could get inside the pseudohuman body of Rawu. A bullet? Gas?

"I'll let you know," he said, glancing at Rawu. "Do you think you can meet . . . their requirements?"

"Marketing looked them up and claims to have something *more* in their offer than just *hot air*. You know—one of those cases where a thing is cheap in one place but costs plenty somewhere else."

"I see," said Fuller. "I'll call you when I decide."

Henshaw nodded with only a tiny flicker of disappointment in his eyes, and went out. Fuller met Rawu's suspicious stare.

More than just hot air, he thought. *Gas, all right! One of those cases where it will down him but not affect a Terran much. But will it get*

to him in that rig?

"What was that?" inquired Rawu. "A coincidence?"

Fuller smiled ruefully.

"Perhaps not," he admitted. "But might it not be worth your while to pretend to think so?"

"How?"

"Whatever the deal is, it must promise tremendous profits to Pyllmar. Probably a chance to sell some by-product at a fantastic price."

"We have done that before," said Rawu, "but you did not deliver the price. You made us clowns instead!"

"Maybe you did not then have anything worth trading."

"And now I have you." Rawu paused about the same time a Terran might have taken to laugh. "But I shall keep you!"

"That doesn't make much sense," objected Fuller.

"What is sense to a Terran? Come over where I can watch you while I examine your files."

Fuller obediently walked over and took the small chair in the corner between the fifth file and the "picture" beside the entrance. Rawu leafed clumsily through the first drawer.

Of course, Fuller reflected, the Bureau knew of many drugs and anaesthetics, but he could think of no way to prevent Rawu from triggering his bomb. The Pyllmarian was like a dud—he could not be disarmed without the risk of setting him off at the first gentle probing.

All I need, thought Fuller, is for them to flash me a message on the

south wall, now that he's facing it!

The forces outside, however, were more resourceful than that.. As Rawu started on the second cabinet, a pretty, dark-haired girl knocked and entered. She glanced toward the sofa, but caught herself as she saw Fuller sitting in the corner.

He recognized her as Bobbie Bauer, one of Lavarro's techs. She carried a pack of folders and papers like a page girl.

"Sorry to interrupt, Mr. Fuller," she said.

Rawu leaned casually against the drawer he had been about to open and said, "It does not matter."

Fuller wondered when the Pyllmarian would remember that the Terrans used intercoms instead of knocking doors so often. Bobbie took a few items from her stack and, at Fuller's prudent gesture, laid them on the desk.

"Will you be here a while, Mr. Fuller?" she asked.

"Why?" he asked, for Rawu's benefit as well as his own.

"Mr. Henshaw told me to pick up a folder when you O.K.'d it. Shall I stop on my way back?"

"Er . . . yes," said Fuller, deciding that "here" meant his corner. "I'll be here a while. When you pass his office, tell him I think it might be a matter of great weight."

Bobbie met his eye as she reached for the door handle.

She got the idea, exulted Fuller. Glad they sent a girl; she picked it up quicker than a man might have.

"And tell him that if I don't get to it before quitting time, I'll give him a lift home and discuss it. He knows where my aircar is parked."

"Yes, sir," answered the girl, leaving without another glance at Rawu, whose presence must have given her goose flesh.

"So? You will meet your friend later?" commented Rawu.

His voice, of course, showed no emotion. Fuller wondered if he were irritated—or suspicious.

"I am disappointed in you," reproved the Pyllmarien. "However, I have changed my opinion about your location. I prefer you at a greater distance while I finish here."

Fuller glared at him before he could control himself. The dart pistol pointed back to the green leather sofa.

"That piece of furniture creaks slightly," said Rawu. "I am turning up my auditory sensitivity. Do not try to rise!"

The B. S. T. man returned reluctantly to the far side of the office, but sat at the end of the sofa near the bookcase. It was probably useless; any dash for the lavatory would end with him looking like a porcupine. And even if he reached the hidden door, he could hardly hope to outrun the bomb.

What hurt him most was that the girl had been sent to check his position, and he had been moved as soon as she left. He wondered if Rawu had done it purposely. He also wondered if they would put together the hints about weight and aircars, al-

though he was not sure they could manage anything in time.

What they would have to do, probably, was to tear a couple of antigrav units out of aircars, or borrow them from some lab. Then they might place them behind walls on opposite sides of the office and try to catch Rawu at the intersection of their fields. With luck, they might make the Pyllmarien regret the metal frame of his disguise.

The picture screen opposite the door glowed into life with an exterior scene. An aircar was being moored to the outside balcony at the end of the main corridor. Techs were already removing the rotors.

They'll bring the whole thing down the hall, Fuller realized. Fast work, but I hope Rawu doesn't look up!

The tech, of course, thought Fuller was still sitting where the girl had spotted him. The agent was perspiring before the screen at last went safely blank.

Rawu took his time with the files. Fuller speculated as to the techs' progress with the aircar. He wished he knew a simpler way. He had heard rumors lately that researchers were looking for some sort of paralyzing field or ray. It was unfortunate for him that they had not yet had any success.

Rawu looked around carefully to check Fuller's position, and began on the third file. He took about fifteen minutes to search it. Occasionally, he pulled out a folder to lay

atop a few he had chosen earlier. Fuller scowled each time.

"Glad there's so much to interest you!" he snapped finally.

"It should interest several other stellar societies," said Rawu. "Hm! So *this* is where you get all those *iraz* crystals that cost so much! That star is not even on the maps."

He did not turn as he spoke, for which Fuller was grateful. The screen behind the desk had come to life again with a sketch obviously made in the greatest haste. It told Fuller that the techs had brought two aircars down from the roof. Rather than spend time removing antigrav units, they had torn off the rotors and hauled the craft to positions behind and in front of Fuller's suite. They were now heaved over

on their sides and braced against the walls toward which they would try to "rise." Along the filing cabinets in the sketch, a broad field of intersecting forces was estimated in pencil.

Then Fuller groaned inwardly. He must have made an audible sound also, for Rawu turned.

The B. S. T. man held his breath. Unable to see directly into the office, the techs were unaware the Pyllmarien was staring almost at the screen.

"Don't bother to look around that way!" said Fuller loudly. "I just yawned out loud."

The screen immediately became a picture of the city's main park again. Someone had certainly fixed a way of hearing what went on within the



B.S.T.'s office.

But the sketch had shown that in another way their scheme was already obsolete. The drawing revealed that a hole had quietly been bored through the wall and the back of the fifth filing cabinet. A trip wire was attached to the third drawer so that pulling it out would close a switch.

And here I am across the room, Fuller thought. *That was fine when I was there, but I'll never get a chance at it now.*

Rawu turned from the fourth file he had been about to open.

"Why go on?" he said. "I have plenty now."

Fuller tensed despite his determination to appear unmoved. The other drew his dart pistol slowly.

"There is little more to discuss," said the toneless voice.

Rawu reached his other hand behind him to seize the folders he had chosen. The organ was limited in its skill by being artificial, and was probably clumsy anyhow to a being accustomed to tentacles. It pushed the first two cabinets slightly aside.

Rawu looked and saw what he had done.

A harder shove made the opening wide enough to pass through.

"What is this?" he asked.

"What it looks like—a concealed door behind the files," said Fuller distinctly.

Rawu took a cautious step forward and peered into the hall.

Knows he can do that without getting his brains knocked in, Fuller thought. *Hope they got everybody*

out of there fast!

Some other time, the vision of the techs, Lavarro, Henshaw, and Bobbie Bauer all scurrying for the various ratholes might have amused him. At this moment, his life and theirs depended upon their speed and stealth.

Rawu stepped back and closed the opening.

"That solves the problem of leaving," he announced.

"Then you had better use it," advised Fuller.

"Why do you warn me?"

"Just a friendly gesture," said the B. S. T. man.

Rawu pondered that for a silent moment.

"I do not believe friendly gestures from the Bureau," he said. "Why do you want me to leave so quickly?"

"No reason. In fact, I don't expect to see you go."

"I know. I told you that. But I also told you I do not underestimate you. Let me think—"

Fuller shrugged and stolidly met the Pyllmarian's stare. He allowed his eyes to flick toward the files just once.

"You never seemed deeply disturbed," said the other at last, "until I was near the end of the files. Then, at one point, you made a sound of . . . discouragement? Dismay?"

"Something I ate," said Fuller bluntly.

"I do not believe you!"

The Pyllmarian hesitated, then moved back to the fourth file. He touched the handle of the top drawer.

"You are trying to hide something from me," he accused.

"Me? Go ahead—search the whole file!" said Fuller, letting his eyes touch the fifth cabinet an instant.

Rawu noticed again.

"Anyone with enough intelligence to perform the most basic life-functions," declared Fuller with an obvious show of desperation, "would have the brains to get out of here!"

Rawu let his "hand" move down over the handles. Fuller tightened his lips as the Pyllmarian reached the third dawer.

"Perhaps" in here?" suggested Rawu, watching him closely.

"Now, listen!" said the Terran, squirming in his place. "What's in there has nothing to do with you or Pyllmar!"

"So? I almost believe that—"

He paused, and Fuller could all but hear the tentacled being inside the shell laughing at him.

"But you convince me of the secret's value!"

He pulled out the file drawer.

It was as if a gigantic, invisible foot had trod across the south end of the office, leaving an abrupt print.

Rawu collapsed with a raucous discord from his speaking apparatus. He lay very flat. The floor seemed to writhe away from him, as the springy covering was compressed by its own suddenly increased weight.

The open drawer bent downward like a watch in a surrealist painting. Then the metal snapped, and the projecting half leaped to the floor

with its scattering folders like tacks clicking against a powerful magnet.

Fuller sprang up and ran for his desk visor.

"Scan him and see if he's moving inside!" he yelled.

He snapped on the overhead scanner and its disguising light fixture as the several doors burst open to admit a rush of people. He saw techs, Lavarro, Henshaw, Bobbie, and cops.

"Get out of here!" he shouted at them. "At least till we know he's really pinned. He might set it off anyhow!"

"Mr. Fuller?" someone piped from the desk visor.

"What is it?" demanded Fuller, crouching to sprint even as he realized how ridiculously futile it would be to try.

"Scanners show no motion inside the dummy!"

Fuller found himself sitting in his own chair. He drew a hand across his forehead, and it came away damp. The others were staring past him. He swiveled around in the chair.

Rawu lay flat on his back, as he had fallen when the dummy's knees had collapsed. The end of the file drawer rested across an arm, depressing the pseudoflesh remarkably. Fuller hoped it pinched the tentacle inside.

The depression in the spongy floor covering ran from wall to wall. Where it ended, the panels buckled gently, and their light was quite dim. Fuller made a mental note to ask one of the techs about that effect of

the antigrav.

"Can you put him to sleep?" he asked Henshaw.

"Sure!" replied the other. "Make a hole in it somewhere."

"Careful!" warned Fuller. "Don't get caught in it!"

The group parted to yield passage to the hard-faced noncom from Security. He had a red-painted fire ax from the hall.

"Nothing in the head, right?" he asked.

"Right, but try not to smash it," said Fuller.

The ax bearer approached the edge of the dent in the flooring, sighted along the handle, and poked with a motion like a billiard player's.

The ax head entered the field, and immediately slashed downward, decapitating the figure on the floor. The head bounced away a few inches with a metallic *clink*.

"All right," said Henshaw, dragging up a cylindrical tank. "Better step outside. This might spoil the appetite!"

Fuller glanced about amid the chatter. He felt strange stepping through the door after wanting to for so long. He felt he needed a shower and a bottle.

I'll be the emptiest-headed comet of the whole Bureau if I don't find some good in this somewhere, he told himself.

It was not easy.

Three days passed before he found a satisfactory answer.

He was sitting in his restored of-

fice, signing the final arrangements, when Henshaw dropped in.

"Well, well! How are you today?" he greeted the other agent. "This is Mr. Rawu, of Pyllmar. You may have met."

Henshaw stared but recovered himself quickly. The Pyllmarian, without his Terran disguise, showed a handsome hide of silvery gray with yellow and green markings. He carried a metal box almost the size of a human head.

"Please do not go," the box said to Henshaw in Rawu's "human" voice. "I was just about to leave."

"Yes, that about terminates the business," agreed Fuller. He jabbed a button on his desk and said, "An aircar for Mr. Rawu at the roof elevator!"

He escorted the Pyllmarian to the door personally, and promised to call on him at the B. S. T. hotel for stellar traders before his ship left. Then he returned to his chair.

"You'll have to get rid of that gape, Hen," he advised, "if you expect to get far around here."

"How did you manage that?" demanded the other. "Last time I saw that fellow, we were sawing his shell apart, holding cushions around in case that pineapple of his dropped out."

Fuller leaned back, clasping hands behind his head.

"Well . . . I started with that order you brought me during the . . . ah . . . interview. Of course, you had it drawn up to seem believable in

case he read it."

Henshaw nodded modestly.

"So," continued Fuller, "we're going through with it, at considerable profit to Pyllmar, which will be paid for by whichever unfortunates find it necessary to purchase the material from us. In return, we get all the secrets and manufacturing rights connected with Rawu's little grenade. It will be nice to have it only in our own pocket."

"Yes," mused Henshaw. "I've known times I'd have felt better with one to flourish when I wanted out."

"Exactly. Then there was one other little item, which I think Rawu cherished above the commercial part."

"What's that?"

"Well," Fuller said, stroking his

neat mustache placidly, "the Pyllmarian weak link is sensitivity. I convinced him that the raw deal of three years ago would be completely overshadowed by the story of how he held me prisoner—in my own office—in the Bureau's fabulously guarded headquarters, for over three hours!"

Henshaw was horrified.

"You're going to publicize that? They'll be making jokes about us from here to the Edge! Every sharpie in the galaxy will be pointing for us!"

Fuller managed to look rather like a well-fed cat.

"It's time we encouraged them to underestimate us," he declared. "I had a bad time because Rawu wouldn't."

THE END.

IN TIMES TO COME

This month's *In Times to Come* is devoted exclusively to the interests of subscribers; many have complained at the manner of shipment of *ASF*. The subscriber copies are shipped folded with the cover-side inward; unfortunately that tends to put a crease down the center of the cover.

This method is not used thoughtlessly, accidentally, or with malice aforethought; it is the result of practical experience and testing.

Magazines are mailed Second Class; they are shipped in large bags, and the bag shipments are broken down for local distribution at various major city centers. Second-Class matter cannot be handled with the delicacy and gentleness of First-Class matter; it gets freight treatment. The results, by experience, are:

Magazines shipped flat, if they are as thick as this one, are almost certain to get stressed the wrong way somewhere in shipment, resulting in a crease across the short axis—and a broken backstrap.

Magazines shipped folded have much higher mechanical strength, and are almost immune to that form of damage. But if they are shipped folded cover-out, so that the cover is not creased, the cover is subject to scuffing and consequent abrasion damage.

Shipped cover-in, the magazine is subjected to the least probability of appearance damage.

It is, of course, technically possible to ship it First Class, with cardboard protectors. But it isn't economically possible.

THE EDITOR.

FOUNDLING

BY DONALD BAKER MOORE

A foundling is always a bit of a problem. But this Foundling slept peacefully in the Bay, had done nothing, gave no trouble . . . except causing a few cases of sheer madness . . .

Illustrated by Swanson

I obviously cannot disclose the source of this transcript, but for equally apparent reasons it is essential that the public be permitted to decide this matter rather than leaving it in the hands of a scant dozen men.

VIA: Courier
TO: Commanding General, Secret Defense & Security, USA.
PRIORITY: EXISTENCE
CODE: QZZAQR QBBAWR
Decode follows:

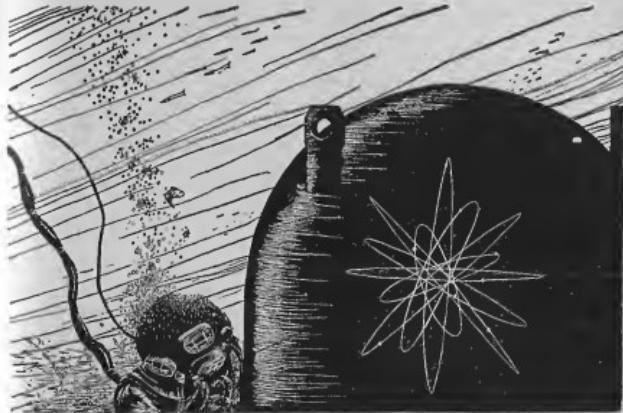
Herewith transmittal file and references to matter urgently — rpt. URGENTLY — requiring your immediate attention.

EXTRACT:
Form Report from San Francisco

Toll Bridge Authority to San Francisco Harbor Security Group.

... the diver continued routine investigation of the central anchorage of the bridge. In passing around the northeast corner of the pier he noticed a large object on the bottom, some distance from the foundations. On cursory examination this proved to be a large cylindrical metallic object resting in the mud. The presence of such an object is inexplicable to this authority. It is not deemed to be a menace either to the bridge or to navigation and no further investigation was made.

ORDER:
San Francisco Harbor Security Group to Commanding Officer, Tug



Jane Marie:

Proceed with examination of large metallic object resting on bottom, NE corner, central anchorage, bay bridge.

Disposal as required.

REPORT:

Commanding Officer, Tug *Jane Marie* to SF HS Gp:

Proceeding under orders, this tug anchored at stated location and dropped diver. Diver reports object as described:

Hemispherically capped cylinder, six feet in diameter, resting vertically on bottom. Protrudes about eight feet from mud. Object is completely lead sheathed with three hoisting lugs around top edge.

Recommend examination by navy mine officer before disposal.

REPORT:

TO: SF Harb. Sec. Gp.
BY: Lieut. James Mallen, USN,
Mine Officer attached.

Acting per your orders, proceeded in Tug *Jane Marie* to center anchorage, bay bridge. Preliminary examination reveals object as described. I was not able to identify object as any known ordnance item, but, due to similarity to design of certain war mines, would recommend full investigation by Combined Service Mine and Bomb Disposal Team before allowing object to be moved.

GENERAL REPORT, SF HARB
SEC GP TO:

All Military and Naval Harbor Control Headquarters, Copy each to 6th Army Group HQ and Pac. Coast Naval Dept. Hq.

Combined Service Mine and Bomb Disposal Squad No. 143 will proceed to investigate and make report on object as described in attached Harbor Authority Report. During the hours 08:00 and 18:00 this date, no harbor traffic will be permitted through east span of bay bridge.

CONFIDENTIAL

TO: SF Harb. Sec. Group
FROM: Combined Service Internal Security Detail

Effective immediately this office will handle all orders and reports re: submerged object, bay bridge.

Until further notice HS Gp Tug *Jane Marie* and Combined Service Mine and Bomb Disposal Squad 143 are detached and placed under this command.

Your group is relieved of all responsibility in this matter and all record of it is to be transmitted to this office.

Colonel Allen B. Wright
Commanding Officer
Comb. Serv. Int. Sec. Det.

REPORT, M & B Squad 143
TO: CSISD
BY: Lieut. Y. W. Cone, commanding

This squad has completed initial study of reported object. Investigation has been delayed by conditions of location. Object rests partially covered by bottom mud under one hundred fifty feet of water necessitating slow work by myself and men who are not familiar with use of diving dress in deep tidal waters.

No positive identification of object can be made. Its shape and structure are closely similar to the Mark IV series of underwater mines developed during the late war.

Object cannot have drifted to this location because of its probable high mass. Due to shape and design it cannot be any object of normal marine jetsam.

Since this is an unknown object designed for immersion during extended intervals—vid. lead sheathing—and since it must have been deliberately placed, I am forced to conclude that it must be an item of underwater ordnance probably foreign in origin.

I have made arrangements for extended examination along this line and recommend clearance for this purpose for a minimum period of one week.

FURTHER REPORT, (see above)

Photographs and measurements attached. Careful excavation has disclosed only that object is a symmetrical hemispherically capped cylinder twelve by six feet, sheathed

in seamless lead jacket with three six-inch hoisting rings on top edge. In center of side there is a one-foot square raised plate which is certainly an entrance hatch but it is melted into one piece with the jacket.

This is almost certainly an underwater mine. Every structural detail tends toward this belief. Request your decision as to attempting internal investigation.

SECRET

TO: Lieut. Y. W. Cone commanding 143rd CS M & B Disp. Sq.; Comm. A. J. Rath, Tug *Jane Marie*; Commanding Officer, SF Harb. Sec. Group

All information and data relevant to current investigation under immediate supervision of Lieutenant Cone shall be classified as secret.

This investigation shall henceforth use code name DADO.

Colonel Allen B. Wright
Commanding Officer
Comb. Serv. Int. Sec. Det.

SECRET

TO: SF Harb Sec Gp

Until completion of DADO all maritime traffic will be routed through west span of bay bridge.

SECRET

TO: General Richard Laite,
Pacific Coast Dept.,
Comb. Serv. Int. Sec. Detail
FROM: Commanding Officer, SF
Sect.

CODE: ABAAJ DUENA
Sir;

After a personal interview with Lieutenant Cone of the 143rd Mine and Bomb Disposal Squad I have considered this matter thoroughly and have arrived at the following conclusions:

We must agree with Lieutenant Cone that DADO is an underwater mine of some nature.

It was placed at night by some ship entering or leaving the harbor. It has been in position at least one month but not more than three.

It is impossible to ascertain which of more than one hundred foreign ships may have laid it.

Judging from our own developments in underwater ordnance, i.e. anti-disturbance, long delay fuses, et cetera, it will not be advisable even in ordinary circumstances to move this object.

HOWEVER, in re. US Secret Defense and Security Bulletin J-7, which, of course, Lieutenant Cone has not seen, I am impressed with the similarity of this object to the third category of potential atomic attack devices.

I believe that we must assume this to be a weapon of the described nature. In such an event, the most extraordinary fusing arrangements will have been made. In short we must accept the fact that it will have such an array of devices that any interference in its action will be impossible. Any or all of the following may be present: Thermal fuses set to fire upon abnormal changes of temperature which would preclude

freezing the mechanisms. Photoclectric devices set to detonate under radiation such as visible light or Xrays, and probably pressure differential reactors set so that if the wall is penetrated and the external pressure is different from the internal, it will fire.

All of these, of course, in addition to very sensitive anti-disturbance fuses of the current types. I have elaborated to show why we can make no real examination of the bomb's structure.

Assuming this to be an underwater atomic mine protected as described, it will probably be detonated by arrangement. Under the circumstances there are only two feasible means, the first and simplest being a long delay clockwork. This would allow us a definite but unknown length of time to take any precautionary steps possible before detonation.

The second alternative is that it will be triggered by some sort of underwater sound pulse from a unit somewhere in the bay area. This is somewhat unlikely due to the lead sheath which would tend to absorb such signals. To prevent this type of detonation a sound baffle could be placed about it and we would have done this as a simple precaution but for the fact that it might—as reported at Leningrad—have a fuse which depends on a periodic signal to prevent detonation!

I have attempted to point out the difficulties so that you may render a

decision in the proper light. I, myself, feel that there is only one action to take but I do not have the necessary authority for the drastic orders and responsibilities it would incur.

I am placing the matter in your hands and will act only after receiving your orders.

Colonel Allen B. Wright

ATTACHED MESSAGE

TO: Commanding General, Sec. Def. & Security, USA
FROM: Pac. Coast Dept., Com. Serv. Int. Sec. Detail

Sir:

I have thoroughly studied this problem and I believe I realize all the possible actions I may take. It is, however, certainly not a problem for which the Pacific Coast Department should assume responsibility.

It does, in fact, involve our whole program of international policy and might well precipitate war. As I see it:

A. We are convinced that there is an atomic mine in San Francisco bay which will be detonated by some unknown means at some unknown time. The source of this mine is not determinable. We cannot by any means disarm or move this mine since any action on our part must only result in instant explosion.

B. We can make a public announcement, evacuate the bay area, and attempt to dispose of the mine. This is unfeasible because of the national panic that would arise and the demand for reprisal whether the

mine exploded or not. We could not even prove the identity of the "enemy."

C. We can immediately declare a state of war against the probable author of this object.

D. Recognizing that an overt act is desirable before we declare war, and the bare fact is that militarily it would be better to destroy people than have them, panicky refugees, congesting a potential war zone, I would be forced to order bay area military personnel and equipment out on maneuvers and then send a squad in to attempt disposal of DADO. When it explodes we must then declare war on the likely enemy. We can announce that a plane has

dropped an atomic bomb and the facts need not be known.

I am awaiting your decision and shall be prepared to carry out instantly your orders.

General Richard Laite,
commanding.

MEMO:

Secretary of Defense

O.K. Jim we've had it! This one is for you and the President to decide. It's all here in the file. I have only one additional remark to make that hasn't been mentioned:

Keep in mind what the results will be if DADO were proven to be a decoy set to lure us into first action—just so much scrap iron.

THE END

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ARTHUR P. LAWLER, Vice President
of Street & Smith Publications, Inc.

Sworn to and subscribed before me this 29th day of September, 1950. Edward F. Kosmire, Notary Public No. 60-2039700, New York County. (My commission expires March 30, 1951.)

A SUBWAY NAMED MOBIUS

BY A. J. DEUTSCH

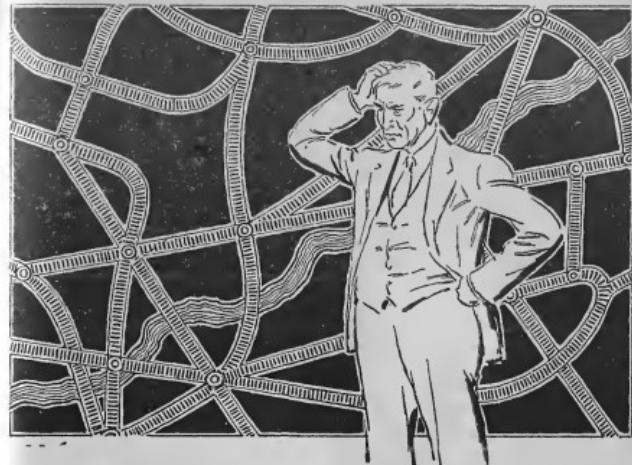
At Park Street you get off the surface car underground and walk downward to get on the elevated. A few more complications and inversions and — maybe a fine research program?

Illustrated by Orban

In a complex and ingenious pattern, the subway had spread out from a focus at Park Street. A shunt connected the Lechmere line with the Ashmont for trains southbound, and with the Forest Hills line for those northbound. Harvard and Brookline had been linked with a tunnel that passed through Kenmore Under, and during rush hours every other train was switched through the Kenmore Branch back to Egleston. The Kenmore Branch joined the Maverick Tunnel near Fields Corner. It climbed a hundred feet in two blocks to connect Copley Over with Scollay Square; then it dipped down again to join the Cambridge line at Boylston. The Boylston shuttle had finally tied together the seven principal lines

on four different levels. It went into service, you remember, on March 3rd. After that, a train could travel from any one station to any other station in the whole system.

There were two hundred twenty-seven trains running the subways every weekday, and they carried about a million and a half passengers. The Cambridge-Dorchester train that disappeared on March 4th was Number 86. Nobody missed it at first. During the evening rush, the traffic was a little heavier than usual on that line. But a crowd is a crowd. The ad posters at the Forest Hills yards looked for 86 about 7:30, but neither of them mentioned its absence until three days later. The controller at the Milk Street Cross-Over



called the Harvard checker for an extra train after the hockey game that night, and the Harvard checker relayed the call to the yards. The dispatcher there sent out 87, which had been put to bed at ten o'clock, as usual. He didn't notice that 86 was missing.

It was near the peak of the rush the next morning that Jack O'Brien, at the Park Street Control, called Warren Sweeney at the Forest Hills yards and told him to put another train on the Cambridge run. Sweeney was short, so he went to the board and scanned it for a spare train and crew. Then, for the first time, he noticed that Gallagher had not checked out the night before. He put the tag up and left a note. Gallagher was due

on at ten. At ten-thirty, Sweeney was down looking at the board again, and he noticed Gallagher's tag still up, and the note where he had left it. He groused to the checker and asked if Gallagher had come in late. The checker said he hadn't seen Gallagher at all that morning. Then Sweeney wanted to know who was running 86? A few minutes later he found that Dorkin's card was still up, although it was Dorkin's day off. It was 11:30 before he finally realized that he had lost a train.

Sweeney spent the next hour and a half on the phone, and he quizzed every dispatcher, controller, and checker on the whole system. When he finished his lunch at 1:30, he covered the whole net again. At 4:40,

just before he left for the day, he reported the matter, with some indignation, to Central Traffic. The phones buzzed through the tunnels and shops until nearly midnight before the general manager was finally notified at his home.

It was the engineer on the main switchbank who, late in the morning of the 6th, first associated the missing train with the newspaper stories about the sudden rash of missing persons. He tipped off the *Transcript*, and by the end of the lunch hour three papers had Extras on the streets. That was the way the story got out.

Kelvin Whyte, the General Manager, spent a good part of that afternoon with the police. They checked Gallagher's wife, and Dorkin's. The motorman and the conductor had not been home since the morning of the 4th. By mid-afternoon, it was clear to the police that three hundred and fifty Bostonians, more or less, had been lost with the train. The System buzzed, and Whyte nearly expired with simple exasperation. But the train was not found.

Roger Tupelo, the Harvard mathematician, stepped into the picture the evening of the 6th. He reached Whyte by phone, late, at his home, and told him he had some ideas about the missing train. Then he taxied to Tupelo's home in Newton and had the first of many talks with Whyte about Number 86.

Whyte was an intelligent man, a good organizer, and not without im-

agination. "But I don't know what you're talking about!" he expostulated.

Tupelo was resolved to be patient. "This is a very hard thing for anybody to understand, Mr. Whyte," he said. "I can see why you are puzzled. But it's the only explanation. The train has vanished, and the people on it. But the System is closed. Trains are conserved. It's somewhere on the System!"

Whyte's voice grew louder again. "And I tell you, Dr. Tupelo, that train is *not* on the System! It is *not!* You can't overlook a seven-car train carrying four hundred passengers. The System has been combed. Do you think I'm trying to *hide* the train?"

"Of course not. Now look, let's be reasonable. We know the train was en route to Cambridge at 8:40 a.m. on the 4th. At least twenty of the missing people probably boarded the train a few minutes earlier at Washington, and forty more at Park Street Under. A few got off at both stations. And that's the last. The ones who were going to Kendall, to Central, to Harvard — they never got there. The train did not get to Cambridge."

"I know that, Dr. Tupelo," Whyte said savagely. "In the tunnel under the River, the train turned into a boat. It left the tunnel and sailed for Africa."

"No, Mr. Whyte. I'm trying to tell you. It hit a node."

Whyte was livid. "What is a node!" he exploded. "The System keeps the tracks clear. Nothing on

the tracks but trains, no nodes left lying around—"

"You still don't understand. A node is not an obstruction. It's a singularity. A pole of high order."

Tupelo's explanations that night did not greatly clarify the situation for Kelvin Whyte. But at two in the morning, the general manager conceded to Tupelo the privilege of examining the master maps of the System. He put in a call first to the police, who could not assist him with his first attempt to master topology, and then, finally, to Central Traffic. Whyte taxied down there alone, and pored over the maps till morning. He had coffee and a snail, and then went to Whyte's office.

He found the general manager on the telephone. There was a conversation having to do with another, more elaborate inspection of the Dorchester-Cambridge tunnel under the Charles River. When the conversation ended, Whyte slammed the telephone into its cradle and glared at Tupelo. The mathematician spoke first.

"I think probably it's the new shuttle that did this," he said.

Whyte gripped the edge of his desk and prowled silently through his vocabulary until he had located some civil words. "Dr. Tupelo," he said, "I have been awake all night going over your theory. I don't understand it all. I don't know what the Boylston shuttle has to do with this."

"Remember what I was saying last night about the connective prop-

erties of networks?" Tupelo asked quietly. "Remember the Möbius band we made—the surface with one face and one edge? Remember this—?" and he removed a little glass Klein bottle from his pocket and placed it on the desk.

Whyte sat back in his chair and stared wordlessly at the mathematician. Three emotions marched across his face in quick succession—anger, bewilderment, and utter dejection. Tupelo went on.

"Mr. Whyte, the System is a network of amazing topological complexity. It was already complex before the Boylston shuttle was installed, and of a high order of connectivity. But this shuttle makes the network absolutely unique. I don't fully understand it, but the situation seems to be something like this: the shuttle has made the connectivity of the whole System of an order so high that I don't know how to calculate it. I suspect the connectivity has become infinite."

The general manager listened as though in a daze. He kept his eyes glued to the little Klein bottle.

"The Möbius band," Tupelo said, "has unusual properties because it has a singularity. The Klein bottle, with two singularities, manages to be inside of itself. The topologists know surfaces with as many as a thousand singularities, and they have properties that make the Möbius band and the Klein bottle both look simple. But a network with infinite connectivity must have an infinite number of singularities. Can you im-

agine what the properties of that network could be?"

After a long pause, Tupelo added: "I can't either. To tell the truth, the structure of the System, with the Boylston shuttle, is completely beyond me. I can only guess."

Whyte swiveled his eyes up from the desk at a moment when anger was the dominant feeling within him. "And you call yourself a mathematician, Professor Tupelo!" he said.

Tupelo almost laughed aloud. The incongruousness, the absolute foolishness of the situation, all but overwhelmed him. He smiled thinly, and said: "I'm no topologist. Really, Mr. Whyte, I'm a tyro in the field—not much better acquainted with it than you are. Mathematics is a big pastime. I happen to be an algebraist."

His candor softened Whyte a little. "Well, then," he ventured, "if you don't understand it, maybe we should call in a topologist. Are there any in Boston?"

"Yes and no," Tupelo answered. "The best in the world is at Tech."

Whyte reached for the telephone. "What's his name?" he asked. "I'll call him."

"Merritt Turnbull. He can't be reached. I've tried for three days."

"Is he out of town?" Whyte asked. "We'll send for him—emergency."

"I don't know, Professor Turnbull is a bachelor. He lives alone at the Brattle Club. He has not been seen since the morning of the 4th."

Whyte was uncommonly perceptive. "Was he on the train?" he asked tensely.

"I don't know," the mathematician replied. "What do you think?"

There was a long silence. Whyte looked alternately at Tupelo and at the glass object on the desk. "I don't understand it," he said finally. "We've looked everywhere on the System. There was no way for the train to get out."

"The train didn't get out. It's still on the System," Tupelo said.

"Where?"

Tupelo shrugged. "The train has no real 'where.' The whole System is without real 'whereness.' It's double-valued, or worse."

"How can we find it?"

"I don't think we can," Tupelo said.

There was another long silence. Whyte broke it with a loud exclamation. He rose suddenly, and sent the Klein bottle flying across the room. "You are crazy, professor!" he shouted. Between midnight tonight and 6:00 a.m. tomorrow, we'll get every train out of the tunnels. I'll send in three hundred men, to comb every inch of the tracks—every inch of the one hundred eighty-three miles. We'll find the train! Now, please excuse me." He glared at Tupelo.

Tupelo left the office. He felt tired, completely exhausted. Mechanically, he walked along Washington Street toward the Essex Station. Halfway down the stairs, he stopped abruptly, looked around him slowly. Then he ascended again to the street and hailed a taxi. At home, he helped

himself to a double shot. He fell into bed.

At 3:30 that afternoon he met his class in "Algebra of Fields and Rings." After a quick supper at the Crimson Spa, he went to his apartment and spent the evening in a second attempt to analyze the connective properties of the System. The attempt was vain, but the mathematician came to a few important conclusions. At eleven o'clock he telephoned Whyte at Central Traffic.

"I think you might want to consult me during tonight's search," he said. "May I come down?"

The general manager was none too gracious about Tupelo's offer of help. He indicated that the System would solve this little problem without any help from harebrained professors who thought that whole subway trains could jump off into the fourth dimension. Tupelo submitted to Whyte's unkindness, then went to bed. At about 4:00 a.m. the telephone awakened him. His caller was a contrite Kelvin Whyte.

"Perhaps I was a bit hasty last night, professor," he stammered. "You may be able to help us after all. Could you come down to the Milk Street Cross-Over?"

Tupelo agreed readily. He felt none of the satisfaction he had anticipated. He called a taxi, and in less than half an hour was at the prescribed station. At the foot of the stairs, on the upper level, he saw that the tunnel was brightly lighted, as during normal operation of the System. But the platforms were de-

serted except for a tight little knot of seven men near the far end. As he walked towards the group, he noticed that two were policemen. He observed a one-car train on the track beside the platform. The forward door was open, the car brightly lit, and empty. Whyte heard his footsteps and greeted him sheepishly.

"Thanks for coming down, professor," he said, extending his hand. "Gentlemen, Dr. Roger Tupelo, of Harvard. Dr. Tupelo, Mr. Kennedy, our chief engineer; Mr. Wilson, representing the Mayor; Dr. Gannot, of Mercy Hospital." Whyte did not bother to introduce the motorman and the two policemen.

"How do you do," said Tupelo. "Any results, Mr. Whyte?"

The general manager exchanged embarrassed glances with his companions. "Well . . . yes, Dr. Tupelo," he finally answered. "I think we do have some results, of a kind."

"Has the train been seen?"

"Yes," said Whyte. "That is, practically seen. At least, we know it's somewhere in the tunnels." The six others nodded their agreement.

Tupelo was not surprised to learn that the train was still on the System. After all, the System was closed. "Would you mind telling me just what happened?" Tupelo insisted.

"I hit a red signal," the motorman volunteered. "Just outside the Copley junction."

"The tracks have been completely cleared of all trains," Whyte explained, "except for this one. We've

been riding it, all over the System, for four hours now. When Edmunds, here, hit a red light at the Copley junction, he stopped, of course. I thought the light must be defective, and told him to go ahead. But then we heard another train pass the junction."

"Did you see it?" Tupelo asked.

"We couldn't see it. The light is placed just behind a curve. But we all heard it. There's no doubt the train went through the junction. And it must be Number 86, because our car was the only other one on the tracks."

"What happened then?"

"Well, then the light changed to yellow, and Edmunds went ahead."

"Did he follow the other train?"

"No. We couldn't be sure which way it was going. We must have guessed wrong."

"How long ago did this happen?"

"At 1:38, the first time—"

"Oh," said Tupelo, then it happened again later?"

"Yes. But not at the same spot, of course. We hit another red signal near South Station at 2:15. And then at 3:28—"

Tupelo interrupted the general manager. "Did you see the train at 2:15?"

"We didn't even hear it, that time. Edmunds tried to catch it, but it must have turned off onto the Boylston shuttle."

"What happened at 3:28?"

"Another red light. Near Park Street." We heard it up ahead of us."

"But you didn't see it?"

"No. There is a little slope beyond the light. But we all heard it. The only thing I don't understand, Dr. Tupelo, is how that train could run the tracks for nearly five days without anybody seeing—"

Whyte's words trailed off into silence, and his right hand went up in a peremptory gesture for quiet. In the distance, the low metallic thunder of a fast-rolling train swelled up suddenly into a sharp, shrill roar of wheels below. The platform vibrated perceptibly as the train passed.

"Now we've got it!" Whyte exclaimed. "Right past the men on the platform below!" He broke into a run towards the stairs to the lower level. All the others followed him, except Tupelo. He thought he knew what was going to happen. It did. Before Whyte reached the stairs, a policeman bounded up to the top.

"Did you see it, now?" he shouted.

Whyte stopped in his tracks, and the others with him.

"Did you see that train?" the policeman from the lower level asked again, as two more men came running up the stairs.

"What happened?" Wilson wanted to know.

"Didn't you see it?" snapped Kennedy.

"Sure not," the policeman replied. "It passed through up here."

"It did not," roared Whyte. "Down there!"

The six men with Whyte glow-

ered at the three from the lower level. Tupelo walked to Whyte's elbow. "The train can't be seen, Mr. Whyte," he said quietly.

Whyte looked down at him in utter disbelief. "You heard it yourself. It passed right below—"

"Can we go to the car, Mr. Whyte?" Tupelo asked. "I think we ought to talk a little."

Whyte nodded dumbly, then turned to the policeman and the others who had been watching at the lower level. "You really didn't see it?" he begged them.

"We heard it," the policeman answered. "It passed up here, going that way, I think," and he gestured with his thumb.

"Get back downstairs, Maloney," one of the policemen with Whyte commanded. Maloney scratched his head, turned, and disappeared below. The two other men followed him. Tupelo led the original group to the car beside the station platform. They went in and took seats, silently. Then they all watched the mathematician and waited.

"You didn't call me down here tonight just to tell me you'd found the missing train," Tupelo began, looking at Whyte. "Has this sort of thing happened before?"

Whyte squirmed in his seat and exchanged glances with the chief engineer. "Not exactly like this," he said, evasively, "but there have been some funny things."

"Like what?" Tupelo snapped.

"Well, like the red lights. The watchers near Kendall found a red

light at the same time we hit the one near South Station."

"Go on."

"Mr. Sweeney called me from Forest Hills at Park Street Under. He heard the train there just two minutes after we heard it at the Copley junction. Twenty-eight track miles away."

"As a matter of fact, Dr. Tupelo," Wilson broke in, "several dozen men have seen lights go red, or have heard the train, or both, inside of the last four hours. The thing acts as though it can be in several places at once."

"It can," Tupelo said.

"We keep getting reports of watchers seeing the thing," the engineer added. "Well, not exactly seeing it, either, but everything except that. Sometimes at two or even three places, far apart, at the same time. It's sure to be on the tracks. Maybe the cars are uncoupled."

"Are you really sure it's on the tracks, Mr. Kennedy?" Tupelo asked.

"Positive," the engineer said. "The dynamometers at the power house show that it's drawing power. It's been drawing power all night. So at 3:30 we broke the circuits. Cut the power."

"What happened?"

"Nothing," Whyte answered. "Nothing at all. The power was off for twenty minutes. During that time, not one of the two hundred fifty men in the tunnels saw a red light or heard a train. But the power wasn't on for five minutes before we had two reports again—one from Ar-

lighton, the other from Egleston."

There was a long silence after Whyte finished speaking. In the tunnel below, one man could be heard calling something to another. Tupelo looked at his watch. The time was 5:20.

"In short, Dr. Tupelo," the general manager finally said, "we are compelled to admit that there may be something in your theory." The others nodded agreement.

"Thank you, gentlemen," Tupelo said.

The physician cleared his throat. "Now about the passengers," he began. "Have you any idea what—?"

"None," Tupelo interrupted.

"What should we do, Dr. Tupelo?" the mayor's representative asked.

"I don't know. What can you do?"

"As I understand it from Mr. Whyte," Wilson continued, "the train has . . . well, it has jumped into another dimension. It isn't really on the System at all. It's just gone. Is that right?"

"In a manner of speaking."

"And this . . . er . . . peculiar behavior has resulted from certain mathematical properties associated with the new Boylston shuttle?"

"Correct."

"And there is nothing we can do to bring the train back to . . . uh . . . this dimension?"

"I know of nothing."

Wilson took the bit in his teeth. "In this case, gentlemen," he said, "our course is clear. First, we must

close off the new shuttle, so this fantastic thing can never happen again. Then, since the missing train is really gone, in spite of all these red lights and noises, we can resume normal operation of the System. At least there will be no danger of collision—which has worried you so much, Whyte. As for the missing train and the people on it—" He gestured them into infinity. "Do you agree, Dr. Tupelo?" he asked the mathematician.

Tupelo shook his head slowly. "Not entirely, Mr. Wilson," he responded. "Now, please keep in mind that I don't fully comprehend what has happened. It's unfortunate that you won't find anybody who can give a good explanation. The one man who might have done so is Professor Turnbull, of Tech, and he was on the train. But in any case, you will want to check my conclusions against those of some competent topologists. I can put you in touch with several."

"Now, with regard to the recovery of the missing train, I can say that I think this is not hopeless. There is a finite probability, as I see it, that the train will eventually pass from the nonspatial part of the network, which it now occupies, back to the spatial part. Since the nonspatial part is wholly inaccessible, there is unfortunately nothing we can do to bring about this transition, or even to predict when or how it will occur. But the possibility of the transition will vanish if the Boylston shuttle is taken out. It is just this section of the track that gives the network its

essential singularities. If the singularities are removed, the train can never reappear. Is this clear?"

It was not clear, of course, but the seven listening men nodded agreement. Tupelo continued.

"As for the continued operation of the System while the missing train is in the nonspatial part of the network, I can only give you the facts as I see them and leave to your judgment the difficult decision to be drawn from them. The transition back to the spatial part is unpredictable, as I have already told you. There is no way to know when it will occur, or where. In particular, there is a fifty percent probability that, if and when the train reappears, it will be running on the wrong track. Then there will be a collision, of course."

The engineer asked: "To rule out this possibility, Dr. Tupelo, couldn't we leave the Boylston shuttle open, but send no trains through it? Then, when the missing train reappears on the shuttle, it cannot meet another train."

"That precaution would be ineffective, Mr. Kennedy," Tupelo answered. "You see, the train can reappear anywhere on the System. It is true that the System owes its topological complexity to the new shuttle. But, with the shuttle in the System, it is now the whole System that possesses infinite connectivity. In other words, the relevant topological property is a property derived from the shuttle, but belonging to the whole System. Remember that

the train made its first transition at a point between Park and Kendall, more than three miles away from the shuttle."

"There is one question more you will want answered. If you decide to go on operating the System, with the Boylston shuttle left in until the train reappears, can this happen again, to another train? I am not certain of the answer, but I think it is: No. I believe an exclusion principle operates here, such that only one train at a time can occupy the nonspatial network."

The physician rose from his seat. "Dr. Tupelo," he began, timorously, "when the train does reappear, will the passengers—?"

"I don't know about the people on the train," Tupelo cut in. "The topological theory does not consider such matters." He looked quickly at each of the seven tired, querulous faces before him. "I am sorry, gentlemen," he added, somewhat more gently. "I simply do not know." To Whyte, he added: "I think I can be of no more help tonight. You know where to reach me." And, turning on his heel, he left the car and climbed the stairs. He found dawn spilling over the street, dissolving the shadows of night.

That impromptu conference in a lonely subway car was never reported in the papers. Nor were the full results of the night-long vigil over the dark and twisted tunnels. During the week that followed, Tupelo participated in four more for-

mal conferences with Kelvin Whyte and certain city officials. At two of these, other topologists were present. Ornstein was imported to Boston from Philadelphia, Kashta from Chicago, and Michaelis from Los Angeles. The mathematicians were unable to reach a consensus. None of the three would fully endorse Tupelo's conclusions, although Kashta indicated that there *might* be something to them. Ornstein averred that a finite network could not possess infinite connectivity, although he could not prove this proposition and could not actually calculate the connectivity of the System. Michaelis expressed his opinion that the affair was a hoax and had nothing whatever to do with the topology of the System. He insisted that if the train could not be found on the System then the System must be open, or at least must once have been open.

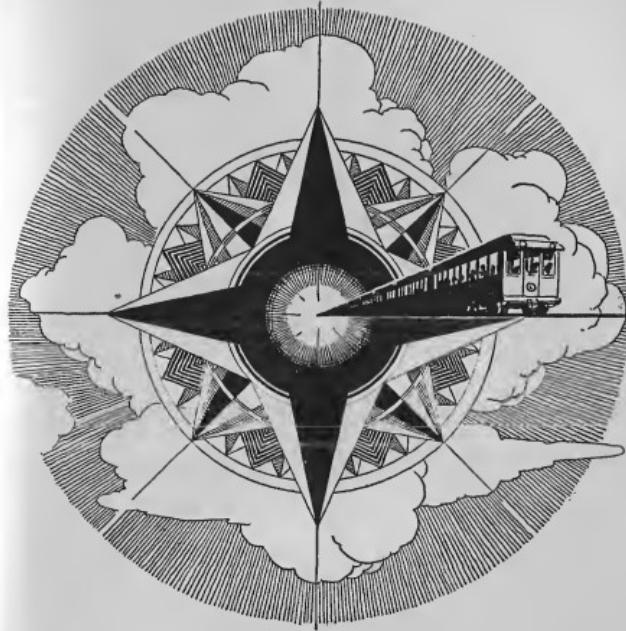
But the more deeply Tupelo analyzed the problem, the more fully he was convinced of the essential correctness of his first analysis. From the point of view of topology, the System soon suggested whole families of multiple-valued networks, each with an infinite number of infinite discontinuities. But a definitive discussion of these new spatio-hyper-spatial networks somehow eluded him. He gave the subject his full attention for only a week. Then his other duties compelled him to lay the analysis aside. He resolved to go back to the problem later in the spring, after courses were over.

Meanwhile, the System was oper-

ated as though nothing untoward had happened. The general manager and the mayor's representative had somehow managed to forget the night of the search, or at least to re-interpret what they had seen and not seen. The newspapers and the public at large speculated wildly, and they kept continuing pressure on Whyte. A number of suits were filed against the System on behalf of persons who had lost a relative. The State stepped into the affair and prepared its own thorough investigation. Recriminations were sounded in the halls of Congress. A garbled version of Tupelo's theory eventually found its way into the press. He ignored it, and it was soon forgotten.

The weeks passed, and then a month. The State's investigation was completed. The newspaper stories moved from the first page to the second; to the twenty-third; and then stopped. The missing persons did not return. In the large, they were no longer missed.

One day in mid-April, Tupelo traveled by subway again, from Charles Street to Harvard. He sat stiffly in the front of the first car, and watched the tracks and gray tunnel walls hurl themselves at the train. Twice the train stopped for a red light, and Tupelo found himself wondering whether the other train was really just ahead, or just beyond space. He half-hoped, out of curiosity, that his exclusion principle was wrong, that the train might make the transition. But he arrived at Harvard on time. Only he among



the passengers had found the trip exciting.

The next week he made another trip by subway, and again the next. As experiments, they were unsuccessful, and much less tense than the first ride in mid-April. Tupelo began to doubt his own analysis. Sometime in May, he reverted to the practice of commuting by subway between his Beacon Hill apartment

and his office at Harvard. His mind stopped racing down the knotted gray caverns ahead of the train. He read the morning newspaper, or the abstracts in *Reviews of Modern Mathematics*.

Then there was one morning when he looked up from the newspaper and sensed something. He pushed panic back on its stiff, quivering

spring, and looked quickly out the window at his right. The lights of the car showed the black and gray lines of wall-spots streaking by. The trucks ground out their familiar steely dissonance. The train rounded a curve and crossed a junction that he remembered. Swiftly, he recalled boarding the train at Charles, noting the girl on the ice-carnival poster at Kendall, meeting the southbound train going into Central.

He looked at the man sitting beside him, with a lunch pail on his lap. The other seats were filled, and there were a dozen or so straphangers. A mealy-faced youth near the front door smoked a cigarette, in violation of the rules. Two girls behind him across the aisle were discussing a club meeting. In the seat ahead, a young woman was scolding her little son. The man on the aisle, in the seat ahead of that, was reading the paper. The Transit-Ad above him extolled Florida oranges.

He looked again at the man two seats ahead and fought down the terror within. He studied that man. What was it? Brunet, graying hair; a roundish head; wan complexion; rather flat features; a thick neck, with the hairline a little low, a little ragged; a gray, pin-stripe suit. While Tupelo watched, the man waved a fly away from his left ear. He swayed a little with the train. His newspaper was folded vertically down the middle. His newspaper! It was last March's!

Tupelo's eyes swiveled to the man

beside him. Below his lunch pail was a paper. Today's. He turned in his seat and looked behind him. A young man held the *Transcript* open to the sports pages. The date was March 4th. Tupelo's eyes raced up and down the aisle. There were, a dozen passengers carrying papers ten weeks old.

Tupelo lunged out of his seat. The man on the aisle muttered a curse as the mathematician crowded in front of him. He crossed the aisle in a bound and pulled the cord above the windows. The brakes sawed and screeched at the tracks, and the train ground to a stop. The startled passengers eyed Tupelo with hostility. At the rear of the car, the door flew open and a tall, thin man in a blue uniform burst in. Tupelo spoke first.

"Mr. Dorkin?" he called, vehemently.

The conductor stopped short and groped for words.

"There's been a serious accident, Dorkin," Tupelo said, loudly, to carry over the rising swell of protest from the passengers. "Get Gallagher back here right away!"

Dorkin reached up and pulled the cord four times. "What happened?" he asked.

Tupelo ignored the question, and asked one of his own. "Where have you been, Dorkin?"

The conductor's face was blank. "In the next car, but—"

Tupelo cut him off. He glanced at his watch, then shouted at the pas-

sengers. "It's ten minutes to nine on May 17th!"

The announcement stilled the rising clamor for a moment. The passengers exchanged bewildered glances.

"Look at your newspapers!" Tupelo shouted. "Your newspapers!"

The passengers began to buzz. As they discovered each other's papers, the voices rose. Tupelo took Dorkin's arm and led him to the rear of the car. "What time is it?" he asked.

"8:21," Dorkin said, looking at his watch.

"Open the door," said Tupelo, motioning ahead. "Let me out. Where's the phone?"

Dorkin followed Tupelo's directions. He pointed to a niche in the tunnel wall a hundred yards ahead. Tupelo vaulted to the ground and raced down the narrow lane between the cars and the wall. "Central Traffic!" he barked at the operator. He waited a few seconds, and saw that a train had stopped at the red signal behind his train. Flashlights were advancing down the tunnel. He saw Gallagher's legs running down the tunnel on the other side of 86. "Get me Whyte!" he commanded, when Central Traffic answered. "Emergency!"

There was a delay. He heard voices rising from the train beside him. The sound was mixed—anger, fear, hysteria.

"Hello!" he shouted. "Hello! Emergency! Get me Whyte!"

"I'll take it," a man's voice said at

the other end of the line. "Whyte's busy!"

"Number 86 is back," Tupelo called. "Between Central and Harvard now. Don't know when it made the jump. I caught it at Charles ten minutes ago, and didn't notice it till a minute ago."

The man at the other end gulped hard enough to carry over the telephone. "The passengers?" he croaked.

"All right, the ones that are left," Tupelo said. "Some must have got off already at Kendall and Central."

"Where have they been?"

Tupelo dropped the receiver from his ear and stared at it, his mouth wide open. Then he slammed the receiver onto the hook and ran back to the open door.

Eventually, order was restored, and within a half hour the train proceeded to Harvard. At the station, the police took all passengers into protective custody. Whyte himself arrived at Harvard before the train did. Tupelo found him on the platform.

Whyte motioned weakly towards the passengers. "They're really all right?" he asked.

"Perfectly," said Tupelo. "Don't know they've been gone."

"Any sign of Professor Turnbull?" asked the general manager.

"I didn't see him. He probably got off at Kendall, as usual."

"Too bad," said Whyte. "I'd like to see him!"

"So would I!" Tupelo answered.

"By the way, now is the time to close the Boylston shuttle."

"Now is too late," Whyte said.
"Train 143 vanished twenty-five minutes ago, between Egleston and Dorchester."

Tupelo stared past Whyte, and down and down the tracks.

"We've got to find Turnbull," Whyte said.

Tupelo looked at Whyte and smiled thinly.

"Do you really think Turnbull got off this train at Kendall?" he asked.

"Of course!" answered Whyte.
"Where else?"

THE END.

THE ANALYTICAL LABORATORY

Once in a while, the An Lab report will line the stories up in the exact order of their appearance on the contents page. That, be assured, is coincidence; the order of presentation of the stories in any issue is a matter of jigsaw-puzzling the type into the available space, plus the convention of putting the cover story in #1 place in the magazine. Since the cover story is always a novelette or serial, that's sort of fixed by factors other than Editorial story-preference. (Though, naturally, we don't make cover-stories out of material we feel doesn't merit special attention.)

At any rate, the September An Lab report matches the contents page listing:

September, 1950 Issue

Place	Story	Author	Points
1.	The Lion and The Lamb	Fritz Leiber	2.21
2.	Paradise Street	Lawrence O'Donnell	2.56
3.	The Sack	William Morrison	2.78
4.	Meteor	William T. Powers	3.55
5.	Spy Scare	H. B. Fyfe	4.05

But despite this coincidence, the order of listing on the contents page is not intended to represent Editor's-choice listings.

THE EDITOR.

VARIETIES OF CULTURE

BY ARTHUR J. COX

A fact article on human cultural patterns — and if human beings, here on one planet, can go this far in one extreme or another, what may we find Outside?

Your first impression was probably wrong. The word "culture" as used in the title has a different meaning than that for which it is used in every day conversation. Here, it actually has more resemblance to the cultures familiar to biochemists and bacteriologists than that used by the literary intelligentsia, though it does refer to human societies.

I will start with an analogy which was first used, I believe, by the late and very brilliant cultural anthropologist, Ruth Benedict.

Consider for a moment the subject of languages and human speech sounds in general. The number of sounds which can be made by the human oral and nasal cavities—lingual, labial, dental, palatal, guttural, both voiced and voiceless—are, for all practical purposes, unlimited. The significant point is that only thirty-five of these sounds are generally used in the English language. The same, rough proportions hold true

for the two thousand eight hundred other languages and major dialects. That is, only fractions of the total are utilized, although the sounds which are used vary widely from language to language. Even languages as similar as English and French and Spanish have marked differences in sounds which can be utilized.

Obviously, no language can use all the sounds known on pain of being unintelligible. Therefore, in the creation—evolution—of a language, selection is the prime process.

It is the same with general human behavior: The number of things which human organisms are capable of—actions, reactions, interests, activities—are similarly unlimited. *Thus, a given society in order to have any structure has to select certain portions of human behavior and build itself upon these foundations.*

Every society on the face of the planet has made such selection of its institutions. One culture, from the

point of view of another, ignores basic things and exploits irrelevancies. One culture's entire structure is based upon recognition of monetary values in every phase of life—in another they are of only the slightest importance. One builds itself upon the foundations of adolescence, another upon death and still another upon after-life. Hostility is the dominant feature of one, gentleness of another. *Ad infinitum.**

But the selections are not made at random and are not separate from each other. They are as inextricably interrelated as the points of a crystalline structure. One aspect, one trait, is supported by another which, in turn, is justified by a third. (This assumes that the society is not undergoing a process of acculturation; that is, that it is not being disintegrated by inner- or intra-cultural conflicts.)

For example, the Baiga of India have no concept of "natural death." Even for the aged, it is always a surprising and unexpected event—they do not assume the inevitability of it. A person never *dies*, in one sense; he is *killed*. But this is more than a curious fact about a distant and primitive people: It has meaning in relation to the society's structure. It correlates with their attitude towards sorcery, the intensity of their intra-personal relations, their acceptance of neighboring mythologies, their freedom from gain-compulsions, and innumerable others.

* For the purposes of the present paper, the fact that the Indo-European world is technologically further advanced than other cultures which will be discussed here is of little importance and will, for the most part, be ignored.

Again, a people's language is expressive of their most basic orientation towards the universe. An almost-extinct American Indian culture, the Wintu, who have a strong sense of a symbiotic relationship with the world, have a language-structure which automatically denotes the speaker's relationships with others and with the physical universe which is being described.

Examination of a culture is in some respects akin to psychoanalysis. It is the little things which reveal its structure—items not noticed by the tourist who is amused by "quaint, local customs." Perhaps the reader can get some feeling from this idea from the following; it is a scene from a motion picture made in Bali by the well-known researcher, Margaret Mead:

A young Balinese mother plays with her few-months-old son. The girl teases the child with her fingers, both laughing, one gurgling. The action is simple, spontaneous, joyful. Certainly, this is real, human—not an action dictated by arbitrary, cultural mores! But then, the baby grasps the finger and on the mother's face there is a sudden, abstracted look, a curious detachment, momentary, as a cloud passing over the sun.

A meager clue and yet it is one which, when traced, reveals the inner structure of the Balinese world.

The Dobu

Considered from a dramatic viewpoint, Dobu might be said to be the most interesting of cultures yet ob-

served.

The cultural norm is "paranoia."

Dobu island is one of the D'Entrecasteaux group; it lies off the southern shore of Eastern New Guinea. The island is rocky and is unflinchingly hostile to man: It is rocky, barren. Fish avoid its shores and it contains but little pockets of dirt in which yams and other hardy plants can grow. The Dobuans are a reflection of their isle.

To nearby peoples, the Dobuans are known as magicians of devilish powers and warriors who will halt at no treachery. This is not the mere prejudice of one people against another; it is a reputation they amply deserve. (Until French intervention, they were cannibals—in a region where such phenomena is largely unknown.)

Dobu has no chiefs. It has no political organization. It has no law. In the usual sense of the word, it hasn't even any religion. A rarity, indeed. It must not be inferred from this that the Dobuans live in a state of anarchy. On the contrary, they have a highly-systematized society. However, *cultural emphasis is placed upon ill will and treachery and they are the recognized virtues of the society.* Dobuan society is arranged in concentric circles, within each of which traditional forms of hostility can be expressed.

Dobu has no priests, shamans or medicine men. In Dobu, *every* man is a sorcerer, *every* woman a witch. Each person practices, "his virulent magic to spin." Magic is indispens-

able for one's daily dealings with the world. Everything is done by magic; every act has supernatural overtones and undercurrents. Magic is highly personalized; it is something which is possessed. Incantations are mumbled under the breath unless some lurker should overhear and gain it for his own. It is difficult—without more space than is available—to get across the intensity with which the Dobuan believes in his magic. The shamans of most pre-literate cultures will say to the European who challenges their magic that "it does not work for the white man." But the Dobuan's belief is inequivocable and without qualifications. It is good and will work for anyone. Thus a Dobuan acquaintance of the anthropologist, Dr. Reo F. Fortune, was able to give him the formula for invisibility and say, without fabrication, "Now, you can go into the shops in Sydney and steal whatever you like."

The largest Dobuan grouping is a named locality of some five to twenty villages which compose a war unit; it is on permanent terms of international hostility with all other war units. But there is no love wasted between two villages of the same war unit and enmity runs high between them. The only peaceful transaction between two war units is when a sorcerer is brought in from a distant locality to divine the identity of a murderer. He is safe because the murderer—by magic, or otherwise—is unfamiliar with him. In Dobu, those from whom one has most to

fear are one's closest acquaintances, neighbors, co-workers, and even relatives. Hostility is the norm, but it is not open. It is kept under cover. To destroy a man, one first becomes familiar with him. Murder is a life-goal. There is comparative safety only within the *susu* — "mother's milk" — the matrilineal lines, composed of mothers and their daughters, through which inheritance descends.

Two villages within a war unit may be joined by marriage, which is always between two villages as the men and women of one village are considered to be "brothers and sisters." But marriage, again, brings no cessation of hostility. From the start, the institutions which compose it create hard feeling and hatred between the two groups.

From the beginning of puberty, Dobu boys do not spend their nights at home but sleep each night in the houses of unmarried girls. A Dobu youth can avoid involvements for many years by leaving the houses well before daybreak. Perhaps when he is at last caught — by oversleeping — it is because he is tired of roaming and is willing to settle with a more constant companion, but he is never thought of as being willing to enter into the literally hard and perilous business of marriage. The marriage is set in motion by a hostile act of the mother-in-law-to-be. She discovers the sleeping youth and blocks the doorway of the house with her own body. He cannot push her aside because she is a witch and could de-

stroy him. (Old women are to be especially feared.) Soon, the awakening villagers notice the old woman squatting in the doorway and congregate before the house. The couple then emerge and sit upon the ground for about half an hour while the villagers gawp at them. After the maternal kin of the girl disperse, the couple are formally betrothed. Their troubles have just begun.

The major problem—if it were not long ago solved by precedent—would be: In whose village should the couple live, with the *susu* of the wife or of the husband? For the relatives of the wife hate the husband, and vice versa. The problem is solved very simply. From marriage until death, the couple live for alternate years within one village and then the next. Each alternate year, the husband is in command of the situation and the wife must efface herself before her husband's relatives; then, the next year the situation is reversed.

There are tensions of a more intimate kind: Faithlessness between a man and his wife is expected. No Dobuan can conceive that a man and a woman can be together for even the shortest interval for other than sexual purposes. (Verbally, the Dobuans evidence an extreme prudishness.) Again, the spouse in whose village they are currently living has the advantage of the situation, as incest is a favorite pastime.

As a last resort, in a difficult situation, suicide may be attempted. In marital situations, this is usually

through traditional means and is rarely fatal. But the act will enlist the aid of the spouse's *susu* for they dread the arduous and particularly obnoxious obligations which they hold towards their recent dead. And so, suicide is an effective form of blackmail—but that doesn't tell the whole story.

The chief food of the Dobuans is yams. Yams are conceived of as persons who wander at night from garden to garden. (There is little chance of checking this postulate as Dobuans are terrified of the dark.) The task is to get them to stay in one's own garden. This is, of course, done through incantation. Thus, if one man has larger yam crop than another, it is because he has magically stolen them from the other. And so, in Dobu, harvesting is not an occasion for ceremony and ostentatious display as it is on the other islands of Melanesia; it is, literally, as secret as theft.

From this it can be seen that material success in a community like Dobu must necessarily be very different from what it would be in our culture. Accumulation of goods is not possible. In the case of yams, even one successful harvest spied out by others is occasion enough for the practice of fatal sorcery. Ostentatious display is also barred. Some thought will show that the only endurable setup would be a system of counters that pass through each man's hands but do not remain with him as a permanent possession.

That is exactly the commercial system which is used.

The Melanesian passion for "endless reciprocal exchange" is shared, not only by Dobu, but by the other islands of what forms the Kula ring. The Kula ring is a roughly circular chain of a dozen islands, about one hundred and fifty miles in diameter. (Note: These other islands which participate in the Kula ring are not part of the Dobuan "configuration of culture." For example, the Trobrianders, who live to the north of the Dobu, are a gentle, happy people, made famous by the works of Dr. Bronislaw Malinowski. They, as each people of the chain, interpret the Kula ring in their own fashion. In each it plays a different role, carries a different significance.)

Around this ring, one kind of valuable circulates in one direction and another in the counterdirection, in a semiannual exchange. The men of each island make long voyages across the empty seas; each man has his partner in the exchanging island to each direction and bargains for advantage by every means possible. This is the formal pattern of the procedure but it is more practical than it sounds for each island specializes in one particular craft and thus examples of the handiwork can make the entire round. The system is more complex than can be described here in any detail. Various informal tradings take place under cover. These transactions can become very elaborate and even swindling—a specialized form known as

wabuwabu—is carried on.

As implied, the Kula is on an individual exchange basis rather than a group basis. Each man exchanges individually—and the Dobuan does it with all the forms of courtship. The Kula success charms of the Dobuans are also love charms, and before embarking on their journey they smear their bodies with cosmetics and ointments. The reason for this is simple: To the Dobuan, the spectacle of a nonhostile and peaceful exchange of goods is so incredible that it can only be explained on the basis of physical passion!

Incidentally, if a Dobuan comes off with the poor end of a transaction he never blames his business partner of the foreign island but rather accredits his lack of success to another Dobuan; most likely, his canoe partner and whatever goods this person has were somehow magically stolen from him.

There is another form of ownership in Dobu. A Dobuan will say, "This is so-and-so's tree," and this means that so-and-so has placed a disease-curse or an accident-curse upon the tree so that none but he can take fruit from it. In Dobu, it's very effective. If someone, through a consciousness of his own magical powers, does brave the curse, the owner descends upon it and cuts it down. This is analogous to an attempt to take his own life and brings up the essential point about the Dobuan's attitude toward suicide: It shows clearly that the intent in both cases is not an appeal to the pity and sup-

port of one's relatives but rather that the Dobuan has projected upon himself and his possessions, in his humiliation, all the malice and will-to-destruction which he attributes to the universe and which is required by his cultural institutions. He is limited to one technique in handling the world—even though he uses it in these instances against himself.

Ironically, there is one person who is free from all this; against whom, none directs their venom: The insane. *That is to say, the nonsuspicious, the open and friendly person.* He is humored.*

In short, the Dobuan lives without repression—Man's worst nightmare: That in which both the forces of nature and society are arrayed against him; in which the sea, the wind, the trees and all mankind are his enemies. The Dobuan accepts this. He recognizes in these things hostile forces and he must combat them with all the subtlety and the cunning he can muster.

* The discovery that certain Indian—Asia—societies have never seen schizophrenia has already led to the formulation of the sociological theory of that disease; this has been contributed to by other factors such as the lack of social contact. However, among the savagely primitive people, there are no insane among them. Also, researchers in this country found that not only do most Indian tribes have no word for stuttering, it doesn't even occur in their societies, and so we have the new modern theory of stuttering, as exemplified by the Wendell Johnson school, which is finding wide favor. Perhaps readers will see in all this one H. L. Pyle's answer to Eric Frank Russell's question, "How do you know you're sane?" It might be stated, "How do you know you're conforming to the cultural norm?" and since this is also relative, "How do you know the degree to which you're conforming to the cultural norm?" This puts us on firmer ground; the question, at least, becomes answerable, though I grant it may not be so by introspection, alone.

He asks no mercy and he gives none.

The Zuni:

Within the reach of every transcontinental traveler there exists a remarkable but unspectacular people. To a certain extent, they have the first quality because of the second. The Pueblos of the Southwest: The Zuni, Navaho, Hopi, and others. We shall focus our attention on the first.

The Pueblos have a fascinating history. Certainly, it is little less glamorous than that of the Mexican Aztecs, but history and cultural forces have conspired in such a way to push that latter, fabulous, people into the limelight. The Pueblo civilization had reached its height of glory and was on its downward track long before the Spanish *conquistadores*, who so brutally shattered the Aztec world, appeared on this continent. Their incredibly numerous cities, built in the twelfth and thirteenth centuries, still stand today and we can trace their history back still further to when they carved their homes into the stone hearts of cliffs. Just why the original Pueblo men settled and built their homes in what is one of the most inhospitable areas on Earth isn't known for certain and serious objections can be raised to even the most probable answer, that of "for protection from enemies."

The Pueblos are the only Indian people whose culture has remained intact and unharmed under the impact of the White Man. All others

have—in sometimes subtle fashions—shattered under that same blow. For this reason, of course, they make a remarkable study for the comparative anthropologist. But *not* because they represent typical, but unflawed, specimens of the American Indian cultures which had largely disintegrated before the modern anthropologist appeared on the scene—they don't; they are by no means typical. That's why the Pueblo world-outlook survived while that of the other Indian societies failed to do so.

Cultures, despite wide variety, can be categorized in various ways. One of these is into Dionysian and Apollonian cultures. It's a system borrowed from Nietzsche's study of Greek drama—the two "paths" represent two opposite ways of arriving at the values of existence. The Dionysian seeks them through "the annihilation of the ordinary bounds and limits of existence." As Benedict puts it, "he values the illuminations of frenzy." The Dionysian would agree with Blake's statement that "the path of excess leads to the palace of wisdom." His is the search for the sensational, in its literal meaning.

The Apollonian is cast from the opposite mold. His is the path of moderation and restraint. His world is neat and ordered and mapped and he stays within the boundaries thus described. Violence is foreign to his nature and he never loses his sense of self-identity. Drunkenness is repulsive to him, hallucination a thing distrusted.

Whether the major trend of a cul-

ture is toward Dionysianism or Apollonianism can be discovered from several indicants, one of the most easily-recognizable of which is dancing and dance ritual. In Dionysia, dances are orgiastic affairs and, if the society is far within its boundaries, are interconnected with religion. The dancers are "transported," or—to use terminology from a culture with which we all have some familiarity—"sent." In Apollonia, dances are restrained, ritualistic, often connected with elaborate pantomimes or chants, poetic and allegorical in nature.

The distribution of these two types forms a clearly-seen pattern among American and Mexican Indians: All are extreme Dionysians with the exception of the Pueblos, who are just as extremely Apollonian. The contrast is startling. Aside from certain superficialities, the Apaches and Zunis hardly seem like inhabitants of the same world, not to mention the same area. But in this one instance, at least, the mild Apollonians seem to have demonstrated the greatest survival value.

The dances of Zuni, as of the other Pueblos, are Apollonian dances. They are ritualistic and ceremonious. In the dance there is no ecstasy, no seeking of strange sensations or courting of danger. Those who have seen or heard of the Hopi Snake Dance in which the chief dancer holds a live rattlesnake in his mouth may be inclined to disagree with this, but they are interpreting the situation in the framework of our own

culture. To the Pueblos, the snake is a thing of beauty and is not regarded with the superstitious fear and disgust which we hold towards them. The dance has essentially the same character as the Antelope dance and the attitude and mien is that proper one which each cult member holds toward the patron animal of his cult. (Some Pueblo proverbs, or rather legends, end, "And that is why the rattlesnake is not dangerous." Nevertheless, the poison sacs are pinched out before the snakes are handled in the dance.)

The Zunis are a ceremonious people. The emphasis of the entire community life is placed upon the exceedingly elaborate and complex rituals and prayers. Their ceremonies serve definite and valuable purposes—their dances call up the rain and the wind, lure the game animals over the desert, raise up the corn. In Zuni, priests are the most important group of individuals existing in the society. They are not regarded with the malice and dark distrust which the Dionysian cultures of the Americas have toward their shamans and medicine men. Such an attitude would be incomprehensible to the Zunis, whose priests are social functionaries, possessing no individual sorceries or dark powers but play major or initial roles in traditional ceremonies.

The Zuni gods—the Kachinas Proper—live at the bottom of Dawn Lake. In the dances they are impersonated by the priests, called Kachinas. Initiation into one or more

of the various cults serving the gods—there are three major ones—is an incident undergone by many young persons. The climax of the secret ritual comes when the Kachinas lift their masks and reveal that they are but men, in disguise. For the youth, it is the Great Revelation. He is then handed a yucca whip and instructed to whip the Kachinas, he, who but a minute before was whipped by them. It is his first object lesson that he, as a mortal, must exercise even those functions which the uninitiate ascribe to the gods. But it is more basic than that: It creates that orientation toward the supernatural that is demanded by a society which addresses the gods not only as its father but as its children.

There are few social events of importance outside of ritual. Engagements and marriages attract little attention and are carried off with a minimum of ceremony, as are divorces. The ideal is for the individual to immerse himself in an organization and attract little attention to himself as a person.

The Zuni tendency is to cope with all problems by legislating them into their proper place. They are distressed by their inability to outlaw death. Therefore, they minimize it. Funeral rites are the least elaborate of all and no priest officiate. Here, the Zuni institutions all function to make forgetfulness as easy as possible; excessive mourning is not expected, as is often the case in other Indian societies.

The Zunis are a gentle people. Even the prayer of the War Priests ends:

*"On roads leading to Dawn Lake
May you grow old;
May your roads be fulfilled;
May you be blessed with life."**

Violence is foreign to their nature, and they understand the nature of neither vengeance or self-destructiveness. Suicide is not shocking to them; simply incomprehensible. They can but smile tolerantly at this strangest of all of the White Man's customs.

The Zunis distrust aggressive individuals and those who possess a "personal magnetism." To them, such an aberrant personality-type is one of extreme pathology. "A leader of his people" is a term applied to such a person in the Zuni culture, as it is in ours—but in Zuni it is a phrase of extreme derision! Exhibiting that same attitude towards him that the lay-populace of the Western World holds toward the insane, their verdict is—as a primitive people—"sorcery" and they are sometimes moved to hang him by his thumbs until he confesses. One such person managed to save himself by the lucky fact that he had a remarkable ability for memorizing things by rote. The ritual song-dances of the Zunis are hours in length and takes normal individuals sometimes years to learn; and so, he was able to carve himself a place in their society, even if somewhat precarious.

* Translation by Ruth Benedict.

In short, the world of the Zuni and the Pueblo is an ordered world. Just as their cities are composed of houses situated one on top of the other in strong, balanced fashion, so is their society. Both gods and men have their place under the sun and they are one with each other.

Conclusion

There are several general observations that have been made about all or most societies and they can be categorized in various ways. One of these classifications—into Dionysian and Apollonian cultures—has already been mentioned. Another is into *guilt* and *shame* societies. "Guilt" is used here as referring to the feeling which arises when one's actions compare unfavorably with the indoctrinated ethical code. "Shame" is a feeling which arises when our conduct does not measure up to what others expect from us, and is felt chiefly in their presence. Shame is guilt before others, only. It's a ticklish differentiation, but to state it another way: In a shame culture something is "wrong" only if one is caught at it; one's opinions of oneself are a reflection of what other people think of one. In a guilt culture, one can have—or lack—self-respect independently of other people.

The Japanese have a shame culture. During the war, Ruth Benedict was commissioned by the government to undertake a study of the Japanese society and the result was an interesting and stimulating paper—later a book, "The Chrysanthemum

and The Sword"—which to a large extent shaped the official attitude towards Japan. Viewed from the standpoint of a shame culture, Japan's actions during, before and after the war are eminently logical and "necessary." A similar study is now being made of the Russian people under the auspices of the United States government, by Clyde Kluckhohn.

It's interesting to note the implications which the differences between shame and guilt cultures has for psychoanalysis. Obviously, in a society in which guilt-conscience plays no significant role, the structure of neurosis or psychopathy would be markedly different. Psychoanalysis does exist in Japan but, from the point of view of certain Western psychologists, "it is ludicrously distorted and naive."

There are other divisions of cultures. One, for instance, is into matrilineal and patrilineal societies, and their variations. It might be mentioned here that all cultures—to my knowledge—place their emphasis on the male. There are certain biological reasons for this. I'm not referring to the popular notion concerning women being the "weaker sex." Some peoples simply do not think of them in that fashion. In some societies—the Mundugumor, for instance—the women are as fully aggressive and active as the men and in many cultures they do more work. The important biological distinction is that women bear children. This means that in the majority of so-

cieties young women, even if they do not have exclusive care of the children, are incapacitated for a certain period of time out of nearly every year.

It might be pointed out by a critic of this idea that there are cultures in which women dominate their husbands; for example, the Trobrianders. But they are interpreting the situation in the context of *our* culture. True, the wife dominates the husband but the true ruler of the household is her brother; the "uncle" is the head of the family and the children have much the same attitude towards him as they have towards their fathers in *our* culture.

And among other peoples, women do dominate the household but among these marriage is an unimportant area of life. Contrary to a popular notion, households in societies which practice polygamy are not necessarily torn by jealousies between the wives. Often as not, they dominate the husband and form a bloc against him; the more there are of them the happier they are. Despite this, polygamy is still a popular institution the world over and economic factors seem largely responsible for its present static condition.

Of course, morality varies the world over but, apparently, sex is regarded as evil or sinful only in those cultures which associate sexual excretions with other body-ejections—organic refuse. It is a correlation which seems to hold true. The Balinese,

interestingly enough, have an open acceptance attitude toward sex but—no pun intended—regard the intake of food with distaste. It is usually done hurriedly and secretly. Could anyone honestly and intelligently say that their attitude was pathological?

Speaking of pathology, the concept of romantic love is one which is almost unique to our culture. Though the existence of such severe emotional attachments between men and women have been noticed by several societies throughout the world, ours is the only one to have capitalized on it. The romantic lover is the traditional hero of our literature, just as the epileptic was the exalted protagonist of the Arab story.

References:

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"Readings in Social Psychology," by Newcomb and Hartley: "The Education of Children," paper published therein, by Margaret Mead.

See also: ETC.: "A Review of General Semantics," Volume V, Number 3, "Linguistic Reflection of Winu Thought," by D. Demetropoulos Lee; "The Study of Man," by Ralph Linton, D. Appleton-Century Company, Inc., 1936; "The Theory of Human Culture," by James Feibleman, Duell, Sloan & Pierce, New York, 1946; and "Personality, Society and Culture," by Kuckhorn and Murray, for general information.

THE END.

BOOK REVIEWS

"What Mad Universe," by Fredric Brown. E. P. Dutton & Co., New York. 1949. 255 p. \$2.50.

Another major publisher has taken the plunge into science fiction with a master pilot. The skill and color which won Fredric Brown the mystery writers' "Edgar" may yet earn him an unnamed award in the fantasy field for his gleeful mulligan stew of well tried ingredients dished up with that all-important difference in flavor. The editor of a 1954 science-fiction pulp is kicked into a parallel universe where his magazine is a straight adventure book, where teleportation—via sewing machine—preceded flight, where purple monsters vacation in the Catskills, and where our hero must keep from being shot as an Arcturan spy, earn a living, win the Girl from the hero of the universe, and handle incidental problems as they arise. Mystery-writer Brown helps fantasist Brown with such teasers as: Why are some coins treasures and other dynamite? Why are Model T's and teleportation operating simultaneously? And who and why is Dopelle? Find out for yourselves.

P. Schuyler Miller

"Exiles Of Time," by Nelson Bond. Prime Press, Philadelphia. 1949. 183 p. \$3.00.

Nelson Bond, born storyteller that he is, is the general reader's master of fantasy. This lift from *Blue Book* of 1940 may be corn to the elect, but it will probably be more like corn-squeezin's to the neophytes. Snatched into another era by scientists of Mu, a hodgepodge of Twentieth Century men and women try to avert the Ragnarok of collision with a comet—one of the few times, to my knowl'edge, that a fantasy writer has drawn on Donnelly's little known "Ragnarok: The Age of Fire and Gravel." There is a double surprise twist at the end—one for the innocent and a doozer in an Epilogue quoted from the Norse "Elder Edda." Don't read it out of place unless you're the kind who chews razor blades because you like the taste of blood.

P. Schuyler Miller

"The Star Kings," by Edmond Hamilton. Frederick Fell, Inc., New York. 1949. 262 p. \$2.50.

ASTOUNDING SCIENCE-FICTION

"World-wrecker" Edmond Hamilton, one of the true Old Masters of science-fantasy, provides the new Fell series with his seasoned formula of Graustark transplanted two hundred thousand years into the future. A bored veteran of World War II swaps personalities with a pedantic princeling of the far future, promptly gets into trouble, and has to carry his bluff through a galactic "time of troubles" which involves months of roistering adventure, two beautiful heroines, and one of the most likable villains you could ask for. BEM's are in the minority for a Hamilton yarn, but there are the old reliable touches of color and imagery in the sunrise music from the Glass Mountains of Throon, the worlds of the Dark Cloud, and the final world-smashing slug-fest between galactic navies: good fun for

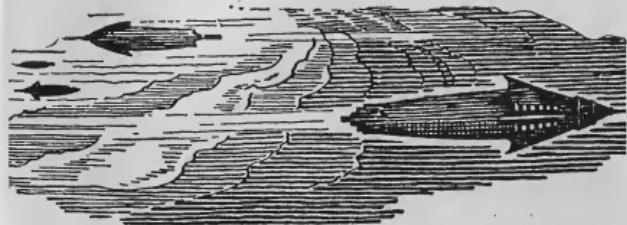
anyone if not exactly literature.

P. Schuyler Miller

"Sixth Column," by Robert Heinlein. Gnome Press, New York. 1949. 256 p. \$2.50

Can an army reduced to one line-officer and five civilians in uniform overthrow, oust, and all but annihilate a foreign conqueror who holds the entire nation in a thoroughly totalitarian grip? Since this is a Heinlein story, and since the group has the Ledbetter action and its various corollaries, the answer is obviously yes—but the real question is how? Here is science fiction's equivalent of the old E. Phillips Oppenheim or modern Eric Ambler intrigue, thrust and counterthrust with civilization at stake.

P. Schuyler Miller



BOOK REVIEWS



ASTOUNDING SCIENCE-FICTION

THE HAND OF ZEI

BY L. SPRAGUE DE CAMP

Third of Four Parts. The ghost—or ghost-writer—of Igor Shtain was acutely aware that his kind of ghost could be laid to rest all too easily. And so many people seemed anxious to prove it! Life threatened to be exciting, but curtailed on Vishnu!

Illustrated by Cartier

Synopsis

In the Banjao Sea on the Cetic planet Krishna lies the Sungar, a floating continent of terpahla sea vine. Rumor associates the Sungar with the janru drug which, smuggled out of Krishna and used in perfumes, enables any woman completely to dominate any man.

The explorer Igor Shtain plans to invade the Sungar to clear up the mystery and incidentally to collect scientific data—actually to be gathered by his associate, George Tangaloa the Samoan xenologist—and material for his books—to be written by his ghost-writer Dirk Barnevelt—and lectures—to be delivered by an actor impersonating him. For in this age of specialization—the Twenty-

second Century—all these experts work for the firm of Igor Shtain Ltd. to set before the public a synthetic entity called Igor Shtain, of which the flesh-and-blood Shtain is only a part.

The flesh-and-blood Shtain, however, disappears, and the dismayed members of his firm suspect he has fallen afoul of the janru ring—perhaps been killed or taken to Krishna. As they have a contract with Cosmic Features for fifty thousand meters of Krishnan movie film, a quarter of which must be taken in the Sungar, they send Tangaloa and Barnevelt—a shy young ex-teacher suffering from a mother-complex—to carry out Shtain's plans and look for the missing explorer. While Interplanetary

THE HAND OF ZEI

Council regulations forbid revealing inventions and mechanical devices to the pre-machine-age Krishnans, the travelers are allowed to take one-millimeter Hayashi cameras, set in finger rings and looking more like jewels than optical devices.

At Novorecife, the Viagens Interplanetary station on Krishna, the assistant security officer, Castanhoso, advises them to travel as natives of the South Polar land of Nich-Nyamadze, who shave their scalps. They thus need not wear green wigs or dye their hair, though they will still have to don false smelling antennae and ear points to pass as Krishnans. They buy costumes from Vizqash, the Krishnan clerk in the Outfitting Store. Vizqash, a native of Qirib, takes them on a picnic with Castanhoso's secretary. A gang of Krishnans under Vizqash's orders attacks Barnevelt and Tangaloa, who escape by swimming across the Pichidé River. Vizqash, thinking them dead, returns to Novorecife with the girl—who is in league with him—but is arrested when his victims also return to accuse him. However, he escapes before any information can be obtained from him.

Barnevelt and Tangaloa plan to go down the river to Madjbur on the Sadabao Sea, where they will present an introduction from Castanhoso to Gorbovast, the commissioner in the Free City of King Egrar of Gozasland. Gorbovast will give them an introduction to Queen Alvandi of Qirib, whence they expect to leave for the Banjao Sea. Qirib is

a matriarchal monarchy where the females keep the upper hand over the males by the janri drug, and where the king is chosen by lot each year and then ceremonially killed at the end of his year's reign. The travelers pretend they are going to hunt the gván, a sea monster, the stones from whose stomach are believed by the Krishnans to confer Donjuanian powers on a man who carries one. Barnevelt takes the name of Snyol, a famous Nich-Nyami general, and Tangaloa another Nich-Nyami name, Tagde. As a present for Queen Alvandi they take a macaw named Philo, abandoned at Novorecife by his owner, Mirza Fateh, a Cosmopolitan missionary from Iran-Earth—who once lost his wife—killed—and daughter—kidnapped—in a holdup of a Krishnan train.

They proceed to Madjbur by river barge and thence to Djazmuran, south along the coast, by bishtari-drawn train. At the inn in Djazmuran they are forced to room with Sishen, a tourist from the Procyonic planet Osiris, resembling a small bipedal dinosaur. At dinner their picture is taken by a Krishnan photographer with a primitive box-type camera, lately invented on the planet. An ill-mannered traveling-companion named Gavao sits with them and puts a knockout drop into Barnevelt's drink, but Barnevelt switches drinks with him and Gavao falls asleep. A masked aristocrat quarrels with Sishen, and Barnevelt saves the reptile's life by hitting the masked man over the head and stun-

ning him. Barnevelt recognizes the masked man as Vizqash, the former clerk at Novorecife, who, not knowing who struck him, leaves the inn in a rage. Sishen, expressing his gratitude, explains that he did not have time to use the pseudohypnotic powers of his species to gain mental control of the Krishnan.

Next morning Barnevelt and Tangaloa are confronted by a delegation from the local artists' guild who demand the pictures made by the old photographer. They are campaigning against the new art of photography on the ground that it threatens their livelihood. In the ensuing brawl the Earthmen rout the gang, and are then ready to resume their journey.

The travelers go on to Ghulindé, the capital of Qirib—narrowly escaping an ambush by a party of Krishnans led by Gavao—where they present the macaw to Queen Alvandi, a hard-bitten old harridan. The queen approves the gván-hunt and explains that after the forthcoming Kashyó festival she intends to abduct in favor of her handsome daughter Zéi, who invites the two travelers back to the palace for an evening's visit.

Barnevelt and Tangaloa prepare their expedition to the Sungar, buying a small ship—the Shambor—and hiring sailors. Meanwhile they are taken up socially by Princess Zéi and by young Zakkimir, a ward of the throne who admires the supposed General Snyol for his military prowess. Barnevelt, though attracted by

Zéi, is disconcerted to learn that at the forthcoming festival the king is not only executed but also ceremonially eaten.

During the festival the Moryá Sungaruma, or pirates of the Sungar, raid Ghulindé looking for Barnevelt and Tangaloa by means of prints of the photograph made of them in Djazmuran. They meet little opposition, for the men of Qirib do not carry weapons and Queen Alvandi's women soldiers cannot cope with the pirates. In the ensuing fracas King Kidj is killed, Tangaloa wounded, and Zéi abducted. Barnevelt kills Gavao, who appears as a pirate leader, and in the darkness and confusion the pirates withdraw without the Earthmen they sought.

By seizing Tangaloa as a hostage, Queen Alvandi compels Barnevelt to set out in the Shambor with Zakkimir to try to rescue her daughter. They sail from the Sadabao Sea through Palindos Strait into the Banjao Sea, passing the island of Fossanderan, reputedly haunted by some sort of beast-men or demons. They gain access to the Sungar by posing as couriers of the Mejrou Quvaradéna, or Reliable Express Company, bearing an offering of treasure from Queen Alvandi and a letter asking terms for the release of Zéi.

The pirate High Admiral is another Osirian, Sheafasé. Barnevelt finds Shtain serving as a common pirate and, under Sheafasé's pseudohypnotic control, having forgotten Barnevelt and his former life as an

explorer. During the parley Barnevelt and Zakkimir attack the pirate chiefs, kill three of them, tie up Shtain and put him in the treasure chest, and are on their way out with Shtain and Zéi, taking Sheafasé as hostage, when Barnevelt is recognized by Vizqash. Vizqash, it transpires, is also a leader of the Moryá Sunqaruná—though originally a native of Qirib, as are many of the pirates who have fled from the queen's female tyranny. Sheafasé escapes their grasp and Barnevelt, Zéi, and Zakkimir, cut off from their ship, flee through the settlement. Zakkimir leaves the other two in order to draw the pursuit away from his princess.

Part 3

X.

After they had crossed from raft to raft and from scow to scow, they found that their path led up to the deck of one of the houseboats.

Zéi said: "Should we not throw down more of these gangplanks?"

"No. It'd only stop 'em a minute, and would show where we've gone."

"There seem to be but few abroad this night."

"Dinner time," said Barnevelt.

They wound their way from houseboat to houseboat. An adolescent Krishnan brushed by them, giving them hardly a glance, and vanished through the nearest door, whence came the sound of scolding.

They continued on, over decks

and across gangplanks and up and down ladders, until they came to a big roofed-over hulk without signs of life aboard. It had once been a merchantman from the Va'andao Sea, but now looked more like the conventional pictures of Noah's Ark.

They made the circuit of the deck, finding no more ways leading from this ship to any other. It lay at the extreme north-end of the Sunqar settlement, and beyond it the only craft were scattered derelicts not connected with the "city." Barnevelt looked northward, and in the fading light thought he could just see the tattered sail of the rendezvous raft on the horizon. Almost in line with it, the nose of a big derelict that was slowly sinking by the stern thrust up through the vine, a darker pyramid against the dark northern sky.

"This seems to be the bottom of the bag," he said. "What sort of ship is this, anyhow?"

The barnlike superstructure that had been built up on deck had no windows, but three doors: a small one on each side and a large one at one end. All three were closed with padlocks.

Barnevelt settled down to work on the door on the northeast side, where he would be out of sight of the settlement. The lock was a stout one, and he had nothing to pick it with even if he had known how to pick locks. The iron straps to which the lock was attached were nailed to the door and the door frame, and so could not be unscrewed with his

knife blade. With a stout enough instrument he could have pried them loose, but any attempt to do so with knife or sword would, he was sure, merely break a good blade.

As he ran his fingers over the door, however, he became aware of a roughness in the strap that ran from the door frame to the lock. By looking closely and gouging with his thumb nails he made out that the strap was badly rusted—so much so that he could pry flakes of rust off with his bare hands.

The simplest way, then, might be the most effective. He heaved on the strap until it bent outward enough to let him slide the fingers of both hands between it and the door. Then, with a firm grip upon it, he put one foot against the door and heaved. His muscles stood out with the strain.

With a faint crunch the weakened strap gave way. Barnevelt staggered back and would have fallen over the side had not Zéi, with a squeak of alarm, caught his arm.

A minute later they were inside. It was pitch-dark save for the triple moonbeams that came through the open door, which was not enough to tell them what they had got into. Barnevelt tripped over something solid and swore under his breath. He should have thought to bring a candle or the equivalent; but one couldn't think of everything—

That gave him an idea. He felt along the wall, sometimes bumping into things, and before long came to a bracket holding a small oil lamp.

After much fumbling with his pocket lighter he got the lamp lit, then quickly closed the door lest the light betray them.

This hulk was used for stores, piled in orderly fashion on the deck: barrels of pitch, nails, and other things; lumber, ropes of various sizes Flemished down in neat cylindrical piles, spars, canvas, oars, and so forth. A big hatch lay open in the middle of the deck, and by stooping Barnevelt could see that the deck below was also lined with barrels, piles of firewood, bags, and so on.

"Interesting," he said, "but I don't see how it'll help us."

"At least," said Zéi, "we have a place to hide."

"I'm not so sure. If Zakkimir gets away, they'll comb the whole settlement, and even if he doesn't, they'll know there were two more of us. Matter of fact, some people saw us on our way here. I told Chask to meet us on the edge of the Sunqar—"

"Who's Chask?"

"My boatswain. I hope he got away when the ructions started. But even if he does show up at the rendezvous tomorrow, you couldn't expect him to stick around long once the sun was up."

"You know not if he escaped?"

"No. If there were a small boat we could steal, now—"

"I saw none as we came, and 'tis said that to thrust such a craft through the vine were a thing impossible."

Barnevelt grunted. "Maybe so, but

you'd be surprised what impossible things people do when they have to. I'll look."

He slipped out the door and made another circuit of the deck, peering off into the moonlight for a sign of a dinghy. None did he see; nothing but houseboats, the weed growing up to their sides. While he was about it he took a good look at the ship's superstructure to make sure no light showed through from inside. Light *did* show faintly along the bottom crack of the southwest door.

Back inside, he uncoiled some rope and laid it along the sill of the southwest door, meanwhile telling Zéi of his failure.

She said: "Could you not build a raft from these many stiffs and staples?"

"In six ten-nights, with a set of tools, maybe. Say, what were the pirates talking about when that one from Qirib . . . forgot his name . . . spoke of using you as the key to the wealth of the Zogha?"

"That must have been ere I came in."

"So it was. This fellow seemed to have an alternative proposition he wanted to argue, but Sheafasè shut him up, I suppose so as not to spill their plans in front of me."

"That would be—the Qiribo archipirate is . . . or rather was . . . one 'Urgan, not long since a respected commercial of Ghulindé who, taking ill the way his good wife spent his money—as under our statutes she had a right to do—fled to the Sunqar. The true inwardness of his plan I

know not, save that from hints they dropped before me I think 'twas to have Sheafasè place me under his malefic mental suasion, declaring me true ruler of Qirib, seizing the kingdom, and dandling me before the people as a puppet their true rapacious plans to hide. Had not you and Zakkomir intervened, they might indeed have executed such chicane, for many Sunqaruma are from Qirib and so could give their enterprise the feeble surface-tint of lawfulness. But how came you and Zakkomir hither?"

Barnevelt brought her up to date on events in Ghulindé, omitting to mention that to persuade him to come the queen had had to threaten his partner with hot incers. He felt that that detail might take the fine romantic edge off her admiration.

He concluded: "... and so we got in by pretending to be Mejrou Qurardéna couriers. My name is now Sn . . . Gozzan." He knew he'd get his aliases mixed up.

"And who's the Earthman whom you sought to fetch forth in the chest? Methought he was but a common pirate, unworthy of such pains."

"Long story; tell you some day, if we live through this."

"Live or die, 'twill be a famous feat," she said. "Our tame bard shall make an epic of it, in heroic heptameters. A versatile wight you must be, Lord Snyol. From the mountains of Nich-Nyamadze you come to the seas, and from the polar snows to this steaming tropic; from skis you take to ships—"

"Ohé! You've given me an idea."

Barnevelt jumped up and began examining the piles of lumber. After a while he settled on a width and thickness of board as suitable and dragged out several lengths of that size.

"Should be about two meters long," he mused. "They'd better be right the first time, too."

He looked around for a work bench with tools, but such work was evidently done elsewhere in the settlement. Finally he fell to whittling with his knife.

"What do you?" said Zéi. "Make skis wherewith to travel over the terphala-vine? In sooth, a levin-flash of genius. If, that is, we fall not through a gap in the vine to provide a banquet for the monsters of the sea."

"Let's see your foot."

The hours slipped by as Barnevelt worked. When he again opened the northeast door, the light of the three clustered moons no longer shone in through the portal, for they had ridden across the meridian to the western half of the starlit sky.

Barnevelt planned his next steps with care. First he made the circuit of the deck once more, looking and listening for sights and sounds of pursuit. Finding none, he peered to northward across the moonlit waste of weed. It would be the easiest thing in Krishna to get lost while splashing around on the vines at night without map or compass. He could no longer see the pale speck

on the horizon, that he had thought to be the sail of the rendezvous raft, but the nose of the upended derelict still stood out plainly.

Then he knocked at the door, saying: "Put out the lamp and come."

Zéi obeyed him and together they lugged out the four skis, the two oars he had chosen for balancing-poles—he would have preferred something lighter—and an armful of rope. He belayed one end of a length of heavy rope to a cleat on the deck and let the rest of it hang down into the water.

Then he discarded his vest of chain mail, which would make swimming impossible, and with the lighter rope set about making ski-lashings. He had already cut notches in the sides of the skis for the rope, since it would have to pass under the skis. His own skis gave no great trouble. Though he had never made a skilashing before, he was sophisticated in the ways of ropes from his boating experience on Earth, and his expressman's boots afforded his feet the necessary protection.

Zéi's feet, however, were something else. Although he had cut a couple of pieces of sailcloth which he wrapped around her feet to protect them from the rope, he still feared she would be chafed. However, there was no help for it.

"The Sunqaruma are coming!" she said in a loud whisper.

He listened. Over the subdued ground-noise of nocturnal Sunqaro activity came a more definite sound

of many feet, a clink of steel, and a murmur of voices.

He frantically finished Zéi's bindings and hurried to the hulk's side, his boards going *clickety-clack* on the deck.

"I shall have to go first," he said, and lowered himself over the edge, holding the heavy rope. He let himself down to the weed and heard the skis strike water. Then he felt the coolth of the sea around his ankles. For an instant he thought the weed would not bear his weight; that if he let go the rope he would go right on in up to his chin.

The noise of the approaching men grew rapidly louder. Barnevelt could now make out different voices, though not the words.

"Make haste!" came the voice of Zéi from above.

Barnevelt, choking down an impulse to bark at her . . . what did she think he was doing? . . . lowered himself further. The tension in the rope decreased, and he found himself standing on the weed with the water not yet halfway up his calves. He took a gingerly step, and then another, still holding the rope, and found that the vine afforded more substantial support away from the ship's side. He also learned that if one kept moving one kept comparatively dry, whereas to stand in one place meant to sink gradually to one's knees in water as one's weight pushed the terphahl under.

"Hand me down my oar!" he said softly. When Zéi had done so he

tried it and found it not a bad ski pole.

He judged from the sound that the approaching searchers were now coming across the gangplank on the other side of the hulk. That fact left them only seconds' leeway.

"All right," he murmured, "hand me down yours and the rest of the light rope. Now climb down."

"Will you not stand under to catch me?"

"Can't; it would put too much weight in one place."

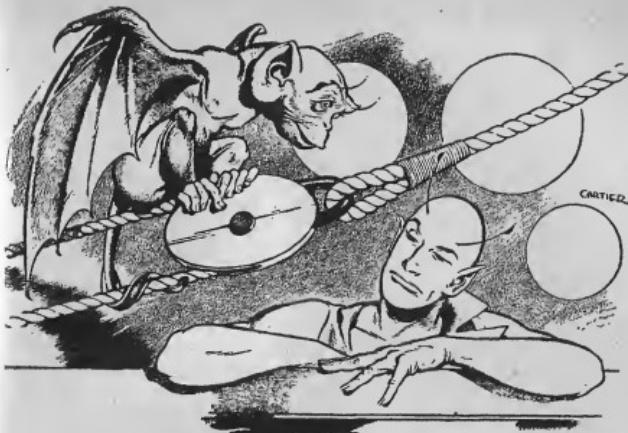
She began to lower herself down as best she could, her skis rapping against the hulk's side. On the far side of the hulk feet sounded on the deck, and Barnevelt caught snatches of speech:

" . . . the gods know we've searched everywhere else—" ". . . if they be not here, they must have flown—" ". . . go round the deck in the other direction, you, lest they—"

Zéi reached water level, took a staggering step on the vine, fouled the whittled nose of her right ski in the terphahl, and almost took a header.

"Watch out!" hissed Barnevelt frantically. "The terphahl's more solid over here. Here's your oar. Now come quickly."

They started hiking off to northward, their skis swishing over the weedy water. Barnevelt snatched a look back at the hulk. Although the hither side of it was now in shadow, there was a hint of movement around the deck and the sound of a door



being opened. Someone called: "They broke in here! Fetch lights!"

Perhaps, thought Barnevelt, the Morýá would be too occupied with searching the hulk to notice that their quarry was escaping in plain sight; not expecting to see people walking on the water they would not even glance out across the weed.

No such luck. A voice said: "What does this rope here? Ohé, there they go!" "Where?" "Yonder, across the terphahl!" "Tis a thing impossible!" "Yet there they—" "Tis witchcraft!" "Bows! Bows! Who bears a bow?" "No one, sir, for you did command—" "Never mind what I commanded, fool, but run to fetch—" "Can you not throw—"

"Keep on," said Barnevelt, lengthening his stride. Behind him the voices merged into a buzzing babel.

"Watch out for that hole," he told Zéi.

The distance increased with agonizing slowness. Behind them came the snap as of a twanged rubber band, followed by a short sharp whistle passing close.

"They shoot at us," said Zéi, in a voice near tears.

"That's all right; they can't hit us at long range in this light." Barnevelt did not feel as confident as he sounded. He felt even less so when the next *whst* came by so close that he could swear he felt the wind of it. What would they do if one were hit?

Whsht! Whsht! That mail shirt would have felt good despite its weight.

Little by little the distance lengthened and the invisible missiles ceased to whizz about their ears.

"We're safe now," he said. "Stand still and catch the end of this rope. Tie it around your waist. That's so if one of us falls into a hole the other can pull him out. Thank the great god Bah you're not one of these tiny girls! Off we go again, and remember to keep moving."

They plodded towards the bow of the upended derelict.

Zéi remarked: "An uncommon sight it is to see all the moons full and in conjunction simultaneously. Old Qvansel avers that this event portends some great upheaval in the realm's mundane affairs, though my mother will not have it so, holding that Varzai governs all and that the old man's talk of whys and wherefores astrological be nought but impious superstition."

"... and rhymes, and dismal lyrics, prophesying change beyond all reason. Why does she keep him on the payroll if she doesn't believe his line?"

"Oh, he's a legacy from my grandmother's reign, and my mother, however harsh she may appear to those who do not know her intimately, cannot bring herself to cast adrift a long-time faithful servant. Besides which, be his star-lore true or false, he's still a man of mighty erudit ... *glub!*"

A sudden tug on the safety-rope staggered Barnevelt. Zéi had fallen

into a hole. Talking women! Barnevelt thought savagely as her head appeared above the water with a strand of terpahla draped over one eye.

"Pull yourself out, madam!" he snapped, moving his skis to keep a constant tension on the line. "On hands and knees, like that."

She seemed to be hopelessly tangled in her skis, but finally got squared away.

"Now, bring your feet around under you one at a time," he said. "That's it. Now grab your oar and stand up. Next time, keep your mind on where you put your feet!"

"Master Snyol!" came an offended voice. "Though you have rescued me from peril dire, no license does that grant you to address me as if I were some kitchen drab!"

"I'll address you worse than that if you don't obey orders! Come on."

She sank into silence. Barnevelt felt a little contrite over his outburst, but not to the point of apologizing. After all, he told himself, with these Qiribo dames you had to get the bulge on them at the start or, accustomed as they were to commanding, they'd walk all over you.

At that, it was probably the first time in Zéi's life that any mere male had addressed her so roughly. It must have been quite a shock, he thought with a trace of malicious relish. He wondered why he felt that way, and presently realized that neither had he ever so spoken to a woman before. His pleasure must come from a subconscious satisfaction at asserting his masculinity

against the female sex. He cautioned himself not to take his burgeoning aggressiveness out on poor Zéi, who was not responsible for his up-bringing.

He cast a look at her as she splashed beside him. With her gauzy tunic soaked and the light of the three moons upon her she might almost as well have had no clothes on. Metaphors of goddesses rising from the sea crossed his mind—

Off to eastward, perhaps a hundred meters away, the surface suddenly heaved. Something dark and shiny—a head or flipper?—showed in the moonlight and then vanished with a loud splash.

"I think," he said, "we'd better both be careful about falling into holes. Wonder how Zakkimir's making out? I like the young fellow and can't understand why he seems so anxious to get himself killed."

"You came, did you not?"

Barnevelt paused before answering. "Ye-es, but then— Is there an . . . uh . . . understanding between you and him?" (He had already asked Zakkimir a similar question, but confirmation would be desirable.)

"Not at all," she replied. "As a loyal subject and familiar of the royal family he's naturally happy for the crown to risk his life."

Well, thought Barnevelt, such feelings no doubt existed among people brought up in a monarchy, even though he, as a native of a planet where the democratic republic had

become the standard governmental form, found it hard to imagine.

They continued their plod and presently came to the bow of the upended derelict. Holding the rail they pulled themselves up the steep deck to a hatch to rest.

Barnevelt looked north, but was still not sure he could see the sail of the rendezvous raft. However, he had a good idea of its direction, and thought he could find it by frequent back-sighting. The settlement of the Moryá Sunqaruma was now a dark irregular outline on the southerly horizon, and Barnevelt picked out the store ship, which he could still discern, as a mark to sight on.

"How are your feet?" he asked.

"Though this be no ballroom floor, yet will they abide."

"O.K., let's go."

They took off across the vine again. The clustered moons now hung low, and Barnevelt thought he saw a faint light in the east, reaching up from the horizon in a great wedge. After a while it faded; this must be the poets' "phantom of false morning." He continued to back-sight on the half-sunk hulk and the store ship.

The moons sank lower, and the pallor of the eastern sky this time looked like the real thing. The smaller stars of the unfamiliar constellations went out, and the sail of the rendezvous raft came into plain sight.

As they neared their goal, Barnevelt lengthened his stride in his eagerness to get aboard and take off

his footgear. He drew ahead of Zéi who, finding herself, towed behind him, called:

"Not quite so fast, pray!"

Barnevelt turned his head to answer, and at that instant his skis pitched forward. The water came up and closed over his head with a gurgle.

Before he came to the surface something struck him a sharp blow in the back, and then he was tangled with human limbs. He knew what had happened: Being behind him instead of to one side of him, Zéi had not been able to resist the pull of the rope as he went into the hole, but had been towed right in after him.

He finally got his head clear, broke a length of terphala that had wrapped itself around his neck, and began to climb out. It was harder than he expected, for the skin got fouled in the vine and made normal movements impossible. When he finally got his feet under him and recovered his oar, he sidled away from the hole and helped Zéi out by pulling on the rope. When she had coughed up half the Banjao Sea and recovered her breath, she said:

"I trust, my lord, you'll not deem it impertinent if I advocate that you, too, watch where you place your feet?"

He grinned shamefacedly. "Turn about's fair play, as we say in Nich-Nyamadze. We're nearly there, thank the gods."

As the light waxed he saw why he had fallen in. They were nearing the edge of the solid part of the Sunqar

and there were many gaps in the vine. Ahead, beyond the raft, the vine was not solid at all, but drifting in yellow-brown patches of all sizes.

At last they clattered onto the raft and sank down on its moldering timbers with a simultaneous sigh of exhaustion. Barnevelt untied his skilashings and turned his attention to those of his companion. She winced at his touch, and when he got the rope and the canvas wrappings off he saw that her feet had been chafed raw in several places.

"Great Qondyorr!" he said. "These must have hurt! Why didn't you tell me?"

"To what end? You could not have borne me across this insubstantial floor of floating weed, and my plaint would only have distracted you from your proper task."

"You've got guts," he said, pulling off his boots and socks and wringing out the latter.

"I thank you." Then she laughed. "Look at your legs!"

In the increasing light he saw his legs were streaked with blue where the dye of the expressman's uniform had run.

A pre-dawn breeze sprang up, making Barnevelt shiver.

"Brrr!" said Zéi. "And I had but just got dry from the previous ducking! Here, doff that wet apparel and suffer me to wring it out. Otherwise 'twill not dry for hours in this dank."

Suiting the action to the word she slid out of her own flimsy garb and

wrung it over the side. Dirk's Chautauqua County past rose up and covered him with a blush as rosy as the dawn, while Zéi, with no more self-consciousness than a one-year-old, hung her clothes on the raft's remaining mast-stay and said:

"What holds my lord from action?"

Barnevelt mutely obeyed, remembering the marriage-customs in More's "Utopia" and noticing that Zéi's well-tanned skin lacked the faint greenish tinge characteristic of most Krishnans. As he took off his jacket, Sheafase's letter fell out. He crumpled it and threw it away. It would serve no useful purpose now, and might cause trouble if it incited Queen Alvandi's curiosity as to why the Moryá Sunqaruma were so interested in her friends from Nich-Nyamadze.

He said: "One good dose of sunburn on those sore feet would cripple you for fair. Maybe I could cut down this old sail to cover us . . . but no, I'd better leave it up for the time being so Chask can find us."

"And if your ship comes not?"

"I've been wondering. Maybe I could sneak back to the settlement at night to steal food and stores for re-rigging this raft or building a new one. Doesn't sound practical, though."

"Oh, so versatile a hero as yourself will overcome all obstacles. Meanwhile, how about sustenance? For I do hunger with a monstrous appetite."

"Now where would I find anything to eat out here?"

"But one of your proven resource and aptitude can surely devise some ingenious expedient—"

"Thanks for the compliments, darling, but even I have limitation. And don't look at me with that famished expression; it reminds me of that beastly custom of your nation."

"Nay, twit me no longer on that subject! The custom was not of my instigation. And fear not that towards you I entertain plans anthropophagous, for like a shomal bred for racing you'd prove all bone and gristle."

He yawned. "We'd better catch some sleep while waiting. You cork off first while I watch."

"But need you not the first repose? Yours has been the heavier—"

"Go to sleep!" roared Barnevelt, feeling very dominant.

"Yes, master." She gave him a worshipful look.

He sat down with his back against the mast, his eyes sweeping the horizon. Now and then he pinched or slapped himself to wake himself up. Memories of all the cartoons he had seen, showing a pair of castaways on a raft, paraded through his mind. As the sea water dried on him it left itchy little flakes of salt. When he scratched his scalp he became aware that his coarse bronze fuzz was sprouting. He'd better find means of shaving it or his non-Krishnan origin would soon transpire.

The moons neared the horizon; the sun should soon be up. Then a

little whitish triangle in the west caught his roving eye: a lateen sail, like that of the *Shambor*. He woke Zéi and said:

"That may be our ship, but we'd better lie down behind the mast so as not to show against the sky, just in case."

"What if it's our foes?"

"Then we shall have to slip into the water and take a chance on the fondaqa."

The sail grew rapidly as the dawn breeze drove it closer. When it drew near enough for the ship's hull to show from where they lay, Barnevelt saw that it was indeed the *Shambor*. He waited, however, until he recognized Chask at the tiller before leaping up to whoop and wave.

When Barnevelt and Zéi climbed aboard the *Shambor*, Chask called another man to the tiller, came forward, and cried: "'Tis the Lady Zéi herself! The sea gods have propoled our enterprise!"

He knelt to the princess while grasping Barnevelt's thumb, looking like some gnarled old sea monster himself.

Barnevelt gave the rest of the crew a wave and a grin. "Greetings, men!"

The men, resting on their oars or standing by the lines, looked back without replying. One or two smiled feebly, but the rest seemed to glower. Barnevelt reflected that he had never been able to get back on good terms with them since he turned down their demand for giving up the expedition.

Chask said: "Is't your pleasure that we make for Palindos Strait with all possible dispatch, captain?"

"Absolutely!"

"Aye-Aye, sir. Back oars!" When they were out of the weed: "Forward on the starboard bank— Now all together— Haul the sheet; up the tiller— Now row for your lives ere the Sunqar galleys find ye. Avé, set course northeast, sailing full and by."

He turned back to Barnevelt. "What befell ye, sir, and where's the young fantastico who accompanied ye?"

"Step into the cabin with us," said Barnevelt.

While Barnevelt salved and banded Zéi's feet with supplies from the first-aid cabinet, Chask rustled them a snack and told his story:

"We lay at the pier, ye see, until this other shallop ties up beside us, and a battalia of pirates disembarks to mount the gangplank to the big galley. Next we know, one of our seamen leaps from the galley's deck into the briny and clammers over our gunwhale, crying that all is lost and we must flee. Whilst we hesitate, unwilling to push off while hope remains, down come the men of the Sunqar with weapons bared, crying to take us.

"At that we went, pausing to cut the rigging of the other shallop, pursuit to incommode. Then forth we row, leaving tumult in our wake, to give the chasers the slip under cloak of night. In truth we hid behind a hulk that lay upon the terpahla's edge and heard the galley's go by

close, searching for us. With dawn we issued from our hidey-hole and, seeing no Sunqar ships, sought the rendezvous in recollection of our skipper's parting orders."

"Good," said Barnevelt, and told as much of his own story as he thought wise. He then asked: "Why are the men so glum? You'd think they'd be glad to see us."

"As to that, two reasons: One, if ye'll pardon my outspeaking, they like this voyage not, which has already cost the lives of four . . . five, if ye count young Zakkomir. Ye know, sir, there's many a man brave as a yeki in his home port, in planning voyages of hazard, who develops second thoughts when peril stares him in the face. Like Kuh the Bold in the chantey. And though I count our greatest danger past, yet do they fear the Sunqar's hand upon their necks before they win to safety. And two: We have that young Zanzir, who mortally hates ye because ye shamed him before his comrades after he'd boasted of his intimacy with ye. Moreover he's lived in Kätaï-Jhogorai, where they have no kings or nobles, and there imbibed pernicious thoughts of the equality of all men. So he'll have it that the life of my lady Zéi—no disrespect to you, madam—that her life weighs no more than that of a common seaman, and that to trade it for four or five of theirs were no exchange but murder and oppression. And thus the crew he's disaffected—"

"What!" exclaimed Zéi, her mouth full of food.

"Think no ill of me, my lady—"

She swallowed and said: "No fault do I impute to you; I'm but astonished by the thoughts expressed. 'Tis either the inspiration of a genius or else the droolings of a madman."

"Nevertheless, so they hold to be the law in Kätaï-Jhogorai—"

"Why haven't you done something about this guy?" said Barnevelt, interrupting what promised to develop into a seminar on government. "Anybody knows you can't have democracy on a ship at sea."

Privately Barnevelt admitted he was not being utterly honest: He had started out on the assumption that you could have it, and he still thought there was something to be said for Zanzir's point of view. But no good would come of admitting that now. Nothing would revive the dead, and besides the men had been fairly warned and were here of their own free will.

Chask said: "I take the liberty, sir, of bringing to your mind your own expressed orders at the start of the expedition: 'No brutality,' you said. So now the time for a swift thrust in the dark, that might this sore have cauterized, is past, specially as Zanzir's careful to keep within arm's reach of his more fanatic partisans—"

"Sirs!" cried a sailor, sticking his head in the cabin door. "A galley's on our trail!"

XI.

They hurried out. The morning

sun showed a sail on the horizon, between them and the diminishing Sunqar. Barnevelt scurried up the mast, and from the height of the parcel could see the hull below the sail, end-on, and the bank of oars rising and falling on each side. From his point of vantage he also made out a second and more distant sail.

He climbed down and looked around the deck. Young Zanzir, at the moment bow oarsman on the port bank, returned his stare as if defying him to start something.

Barnevelt called the boatswain and Zéi into the cabin, unlocked the arms locker, and got out swords for Chask and himself and a long dagger for Zéi. He said:

"It occurs to me that our young idealist might jump us when the Sunqaro ships got close, and turn us over to them in exchange for his own freedom."

"That could be," said Chask, "though honest mariners mortally fear the Sunqaruma, holding them not men but automata animated by the fiendish magic of the monster who rules the swamp."

"Well, if anybody makes a false move, kill him and throw him over the side," said Barnevelt. "After this, use your judgment in matters of discipline."

Chask gave Barnevelt a ghost of a smile, though he refrained from crowing openly.

"Now," said Barnevelt, "I'll make a plot, if you'll help." He turned to Zéi. "You'd better put on some

more seagoing clothes; that gauze thing is falling apart."

He unlocked the slop chest for her and got out the Krishnan equivalent of dungarees. Then he spread his charts on the table and went to work. A swell from the north tossed the *Shambor* about enough to make position-reckoning a bothersome chore. When Barnevelt had finished, Chask said:

"If we go not soon upon the other reach, captain, the Sunqaruma'll be in position to cut us off from the Strait."

"Let's make our tack, then," said Barnevelt. He put on his battered silver helmet—not wishing to sunburn his nude scalp—and went out again on deck.

The north wind had freshened and blew spray from the bow slantwise across the deck. Water squirted in through the oar holes from time to time. With the seas so high the oarsmen could no longer keep a regular rhythm, but had to pause between strokes, oars in the air, until the coxswain called "Stroke!" at a favorable instant.

Barnevelt took another turn up the mast, holding the rungs tightly so as not to be jerked off by a sudden pitch. The wind sang in the rigging, the ropes creaked, and the sail was stretched tautly on its yard. Astern, the pursuing galley, though nearer, labored under similar difficulties. From time to time Barnevelt could see a burst of spray as she dug her bow into a wave. Being a bigger ship she dug in farther than the

Shambor, which rode like a cork. The galley, he now saw, was a two-sticker with a big mainsail forward and a smaller mizzen aft.

When Barnevelt got down again, Chask called: "Ready about!" The boatswain had to ship several oars to get enough men to handle the sail in this wind. "Tiller hard down to leeward! Pay out the vang! Let go the sheet! Cast off the weather stays!"

Watching this complicated maneuver, Barnevelt feared that a sudden gust might tear the sail, now flapping and booming against the mast, or that the mast, now unstayed, might be carried away. In either case they'd be done for. They were drifting before the wind at no small speed, notwithstanding that the remaining oarsmen were backing water.

The deck rumbled under the feet of the crew, scurrying about and wrestling mightily with the sail. Finally they got the wind out of it and shifted the yard to the other side

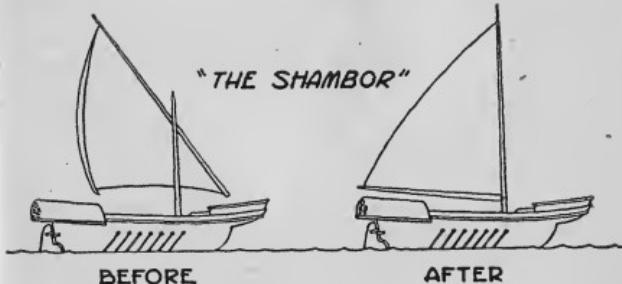
of the mast, with much yelling and grunting and heaving on the lines.

"Tiller up! Full and by!"

The sail boomed and cracked as the wind filled it on the new reach. The men went back to their oars. How much simpler, thought Barnevelt, with a plain fore-and-aft rig, when all you had to do was to bring your helm up sharply and remember to duck as the boom swung across the deck. You could sail closer to the wind, too. He doubted they were making closer than six points. Even an Earthly square-rigger—if any still existed—could do as well as that and could also wear much quicker.

Zéi, standing at his side on the poop, said, "Snyol, wherefore this movement? Will not the Sunqaro ship cut across our path?"

"Not if he uses his sails. He'll have to tack at the same angle we do, and in this chop his oars alone won't be much good—" He frowned at the sky, the sea, and his own rigging. "If we get a real blow, he'll have to run for home, but we shan't be much bet-



THE HAND OF ZEI

ter off. You can't wear ship with this rig in a gale, and we'd have to run before the wind to stay afloat, which would land us right back in the Sunqar."

"What if the wind drops totally away?"

"Then he's got us, too; he has over a hundred men on the oars, compared to our fourteen."

He wondered: If they kept ahead of the galley until night, could they slip away in the darkness? Not with three full moons all shining at once. With rain or fog it would be different, but the present weather did not look much like either. And from the *Shambor's* mast the sail of the second following galley could still be seen.

"Your pardon," said Zéi, "but I feel unwell and must needs retire . . . *wu p!*"

"Use the lee rail!" cried Barnevelt, pointing.

When Zéi had gone below to lie down, Chask came up and said: "Captain, there's one more item I'd ask ye to consider: Not having taken aboard drinking water at the Sunqar, we run low. Men sweat away their water fast on a long oar-chase like this, ye know."

"Ration it," said Barnevelt, watching the galley, whose bearing was changing fast as the *Shambor* cut across her course. Now men were shinning up the yards of both the galley's masts and furling the sails with gaskets, like little brown ants crawling up a straw. Although not without experience at the monkey-

work of sail-handling, Barnevelt was glad he was not up there with them, gripping the swaying yard between his knees like a broncho rider and clawing at the canvas.

Little by little the galley's sails shrank until they were bunched against the yards. Then the yards sank to the deck. The galley crossed the *Shambor's* wake and continued north. Barnevelt figured the galley would try to gain the weather-gauge of her quarry before hoisting sail again, as the difficulties of wearing a lateener would increase progressively with the size of the sail and would be even more onerous for the galley than for the little *Shambor*.

Devoted as he was to sailing, Dirk Barnevelt would have given a lot at that moment for a nice compact little Allis-Chalmers or Maybach gas turbine in the stern to send them scotching for the Strait of Palindos regardless of wind and weather.

The long Krishnan day wore on. Barnevelt went into the cabin, slept, and shaved his head with sea water, lest the bronze hair and beard betray his origin. The men grumbled about the lack of water, shutting up when Barnevelt walked past with a hand on his hilt and a hard look on his face.

Then one of the planet's flying creatures, apparently blown out of its course, came aboard and clung to the rigging. It looked something like a small hairless monkey with bat's wings. Barnevelt killed time by luring it down from its perch and by

evening had it eating out of his hand.

Evening came. The greenish sky remained clear. To the west, red Roqir set behind the galley, now closer and plowing along, its reset sails silhouetted blackly. The stars came out, shining with a hard brilliance unusual in this hazy latitude. Barnevelt picked Sol out of the unfamiliar heavens; from Star-map Region Eight, in which lay the Cetic planets, Sol was almost in line with Arcturus. The clump of moons came up: Karrim the big, Golnaz the middle-sized, and Sheli the little. Like the three bears, thought Barnevelt. With himself in the uncongenial rôle of Goldilocks.

The wind dropped a little. Looking off to the north, Barnevelt visualized a great high-pressure area lying over the Sadabao Sea, sending a sheet of cool dense air flowing southward towards the Sunqar.

"How long should a blow like this last?" he asked Chask.

The boatswain waved a hand in the Krishnan equivalent of a shrug. "Mayhap a day, mayhap four or five. Twill die of a sudden, leaving a week's calm on this stinking sea. I shall rejoice when we're back in the belt of steady westerlies."

The men were tiring, despite the fact that the *Shambor* still carried enough for two complete shifts at the oars. However, the galley drew no closer; her oarsmen must also be tiring.

"Besides," explained Chask, "'tis a thing unlikely they'd essay to run

us down in the dark. A small craft like this can turn and dodge too well, and shooting catapults and crossbows at night, even with the moons, were wanton waste and missiles. Won't ye snatch some slumber, 'captain'?"

Barnevelt had been wondering whether he shouldn't put in a turn at the oars himself, though he knew Chask would disapprove, and he was not sure, now, whether such an act would raise or lower him in the eyes of the crew. His previous attempt to treat them as gentlemen seemed to have miscarried. Besides he did not think his muscles would add much to the *Shambor's* oar power. While he was the tallest person aboard and strong enough by most standards—having the advantage of being brought up on Earth with its slightly greater gravity—he lacked the great bulging shoulders and horny hands of these professionals. In the end he followed Chask's advice, alternating with the boatswain on watch throughout the night.

All night the galley hung off their quarter, a blackness partly outlined by the phosphorescence of her water line and oar splashes. Neither ship showed any light.

At the end of his second watch, as the long night drew toward its close, Barnevelt awakened Chask and said: "I've been thinking that with another rig we could outsail those fellows."

"What's this, captain? Some scheme from the polar regions ye'd broach amongst us? To change a rig in mid-chase like this, be your plan

never so good, were to my thinking plain and fancy lunacy, if my frankness ye'll pardon. By the time your new rig were up—"

"I know, but look." Barnevelt pointed to where the galley's sails showed pink in the rising sun. "They're gaining on us, and by my reckoning we shan't reach the Strait before noon. At this rate they're sure to catch us before that."

"Be ye sure of that, sir?"

"Yes. Matter of fact we're heading too far west, and therefore shall have to wear ship again, which'll take us across their bows practically within spitting-distance."

"Our situation's indeed hard, sir. What's to do?"

"I'll show you. If we plan our change-over carefully and then hop to it all at once, we may just get our new rig up before they catch us. And we shall have a better chance if we do it now before the wind rises and those guys get closer."

"Desperate conditions dictate desperate remedies, as says Néhavend. What shall be done?"

"Pick a couple of men you can trust and bring 'em into the cabin."

Half an hour later Barnevelt's plan got under way. He was not himself so sure of it as he tried to sound, but anything was better than watching the galley crawl up with the inevitability of King Canute's tide.

His plan was nothing less than to convert the present lateen rig into a Marconi or Bermuda rig.

First one of the men went along the foot of the sail, cutting holes in it at intervals, while another cut a coil of light line into short lengths that would go loosely round the yard, which in the new dispensation would become the mast. When everything was ready, Chask put up the tiller and swung the *Shambor*'s bow into the eye of the wind. The sail luffed and the rowers, knowing they had no more help from it, dug in their blades.

The galley, seeing the maneuver, put up her helm also and let her sails flap. Barnevelt realized with a sinking feeling that she could now cut across the hypotenuse of a right triangle to intercept them, since neither was now depending on wind.

"Lower away!" yelled Chask, and down came the great yard, stretching the whole length of the *Shambor*.

The sailors glowered at Barnevelt and he caught one tapping his forehead significantly. But the boatswain gave them, no time to grumble. A rattle of orders sent some to cast off the stays and knock out the wedges that held the mast. Chask put men holding guys at bow, stern, and sides. Others hauled the mast out of its step and set the butt of it on deck beside the partners. The flying thing that Barnevelt had half-tamed flew round and round, squeaking excitedly.

Meanwhile the sailor who had cut holes in the foot of the sail did likewise along the leech, while another cut the strops that held the sail to the yard. Then all hands except the

rowers turned to step the yard in place of the mast. By hauling on the halyard they hoisted the bare pole up to the head of the old mast, now serving as a gin-pole, and manhandled the butt end into the partners vacated by the mast. The tall spar swayed perilously; the men at the guys screamed; but the stick-finally went home with a thump that shook the ship and was wedged into place. Then by shifting the guys to the yard and slackening off the old halyard, they lowered the former mast to the deck.

The galley, with sails furled, crept closer. Barnevelt heard a faint hail come up the wind.

When the new and taller mast was in place, they triced the short edge of the sail to the ex-mast, reeving a light line through the holes in the sail and helically around the spar. Then they triced the intermediate edge of the sail to the ex-yard, now the mast, by reeving short lengths of rope through the holes in that edge and around this spar and tying them with reef-knots to form rings. As these rings were installed, the men hoisted the sail.

"Make haste, rascallions!" shouted Chask. "Yare, yare!"

A louder hail came from the galley. The finishing touch was to lash the yoke that had formerly topped the ex-mast to the ex-yard, loosely enough so the ex-mast, now the boom, could swing, but tightly enough to hold it fast.

On the galley a catapult whanged. A black dot grew into a leaden ball

which arced across the water and plunked in a couple of oars' lengths from the *Shambor*.

Barnevelt told Zéi: "Go into the cabin, Princess."

"I'm no coward; my place is—"

"Into the cabin!" When he saw her starting to obey, he turned to Chask. "Think that lashing'll do?"

"It must suffice, captain."

A sharp whistle, as of a whip, made Barnevelt wince. He saw a man on the bow of the galley start to wind up a heavy crossbow. A second bolt whizzed close.

However, the endless work on the new rig seemed finally done. The sail was fully hoisted. Chask shouted:

"Belay the halyard!"

The sail hung limp, flapping gently. Another minute would tell whether Barnevelt's scheme was sound. He didn't like the look of that limber new mast, but too late for regrets now. He hopped up the steps to the poop and took the tiller from the seaman.

The catapult thumped again. The bullet sailed past Barnevelt, skimmed the deck, and carried away a piece of the port rail with a splintering crash. The rowers flinched as it passed them, breaking stroke. The bow of the galley loomed close, clustered with men.

Barnevelt pushed the long tiller-arm to starboard. The *Shambor* responded, her nose swinging to port. The wind ironed the ruffles from the sail, then filled it. The *Shambor*

heeled sharply as the sail took hold, bringing water in the lee oar ports and breaking the rowers' stroke again; then recovered as Barnevelt corrected his turn.

The whizz of crossbow-bolts was punctuated by sharp drumlike sounds as the bolts tore through the taut sail. Barnevelt could see the two little holes from where he stood. Let's hope they don't start tears! he thought; that sail's a precarious enough proposition with all those ungrrometed holes in it.

Chask, having got the crew straightened out, came to stand beside him. He said:

"Methinks we gain, sir."

Barnevelt took his eyes off the sail long enough for a quick glance back at the galley. Yes, she did look a shade smaller—or was that wishful thinking?

The sound of the catapult came again. Barnevelt caught a glimpse of the ball flying past him. Then it headed straight for the mast. All they needed now was to be dismasted by a lucky shot!

Closer flew the bullet to the mast—and missed it by an eyelash, to graze the roof of the cabin with a loud bang and bounce off into the sea. It was followed by another whizz of crossbow bolts, one of which struck the wood nearby, plunging down at a steep angle.

"They're lofting 'em at us, being too far for direct aiming," said Chask. "In another twinkling shall we be out of range entirely."

The next catapult-missile splashed

astern of the *Shambor*. Little by little they drew ahead. Barnevelt, still tense as a spring, glanced back. The galley, finding oars insufficient, was shaking out its sails again. However, as the minutes passed it became obvious that, as the *Shambor*—with Barnevelt's eye on the sail and hand on the tiller to get every possible degree of close-hauled sailing out of the new rig—could now sail at least a point nearer the wind than her pursuer, the ships were on diverging tracks. The galley, making good time, drew abreast of the *Shambor*, but too far down-wind to be dangerous.

Barnevelt waited until the galley stood out in profile, then put his helm up sharply. The *Shambor* luffed and heeled into the other tack without hesitation. The galley shrank fast as the two ships were now sailing away from one another. Barnevelt saw frantic activity on the galley's decks, but by the time the lateen sails had been laboriously shifted to the opposite reach, she was too far behind for details to be made out.

As the sun climbed towards the meridian the galley receded until her oars were hidden by the bulge of the sea. However, if anybody expected the pursuers to withdraw in baffled rage, they were disappointed. Unable to keep up with Barnevelt's short quick tacks, the galley plodded on under oars alone.

The *Shambor* seemed to be doing so well, though, that Barnevelt

passed the word to reduce the oar-crew to eight men to give the others more rest. He thought the men's attitude towards him improved a bit also. Then it occurred to him that he was hungry. He had eaten hardly anything in the last tense forty-eight hours, and his animal self was beginning to protest. He turned the tiller over to Chask and started for the forward cabin, hoping for a bite in Zéi's company.

"Captain!" said a voice, and there were three sailors, including the argumentative Zanzir.

"Yes?"

"When shall we have water, sir?" said Zanzir. "We die of thirst."

"You'll get your next ration at noon."

"We ask it now, captain. Without it we can't row. Ye wouldn't hold out on us, would ye?"

"I said," said Barnevelt, raising his voice, "you shall have your next water at noon. And next time you want to speak to me, get Chask's permission first."

"But, captain—"

"That's enough!" roared Barnevelt, his fury aggravated by the knowledge that the crew's indiscipline was partly his own fault. He went forward to the deckhouse, hearing behind him a mutter in which he caught the words: "... high and mighty emperor, is he?"

"What ails my captain?" said Zéi. "You look as sour as Qarar when he'd been deceived by the King of Ishk."

"I'll be all right," said Barnevelt,

slumping down on a bench. "How about a spot of sustenance, girl?" He felt too weary to worry about the fact that this was not the usual way of addressing a princess. "That is, if you know how to rustle food."

"And why should I not?" she said, rummaging on the shelves.

"Aaow," he yawned. "Being a Crown Princess and all that nonsense—"

"Canst keep a royal secret?"

"Uh-huh."

"My lady mother, mindful of the revolutions that have most piteously overthrown the ancient order in Zamba and elsewhere, has compelled me to learn the arts of common housewifery, so that come what may, I shall never be utterly at a loss for such elements as feeding and clothing myself. Would you like some of these dried fruits? Meseems the worms have not yet made them their domicile."

"Fine. Let's have that loaf of bread and the knife."

"Heavenly hierarchy!" she exclaimed when she saw what he proposed to tuck away. "But then, I ween, heroic deeds go with a heroic appetite. All my life I've read legends of Qarar and his ilk, though knowing none besides our fragile local popinjays, I had, until I met you, come to think such men of hardihood existed nowhere but in song and story."

Barnevelt shot a suspicious look at Zéi. Although he liked her the best of any Krishnan he knew, any seri-



ous entanglement was obviously not to be thought of.

He said: "You don't look forward, then, to being queen with a freshly-painted Qirib each year for a husband?"

"Not I; though even misliking it, I lack the force or subtlety to swerve events from their appointed course. 'Tis one thing to talk big, like the heroine in Harian's 'The Conspirators,' of casting aside the comforts and prerogatives of rank for love, and quite another so to do in very fact. Yet sometimes do I envy common wenches in barbarous lands, wed to great brutes like yourself who rule 'em as my mother does her consorts. For while female domination is the law and custom of Qirib, I fear by nature I'm no dominator."

Barnevelt thought vaguely of sug-

gesting a revolution in Qirib, with Zei in the rôle of Shaw's "Bolshevik Empress", but he was too tired to pursue the matter.

"Ao," he said, "only my fair share of the water!"

"But you're captain—"

"Only my fair share."

"Such scrupulosity! One would think you, too, had dwelt among the republicans of Käta-Jhogoral."

"Not exactly, though I sympathize with their ideas." He patted a yawn and sprawled out on the bench while she cleared the table.

The next he knew, Chask was shaking him.

"Sir," said the boatswain, "the wind drops and the galleys press upon our wake!"

Barnevelt sat up, blinking. Now

that he noticed, the motion of the ship did seem less and the noise of wind and wave lower.

He went out. Although they were still bucking a swell from the North, the swells were smooth from lack of wind to ruffle them. There was just enough breeze to keep the sail filled. Chask had already put a full crew back on the oars.

Behind them the galley loomed about as distant as when Barnevelt had gone into the cabin. No doubt the *Shambor* had drawn farther ahead after he went in and then lost some of her advantage with the dying of the wind. Moreover the second galley, which they had seen the previous day, was now in sight again, its masts alone visible save when a wave lifted the *Shambor* to an unusual height.

Without wind the galleys would soon catch them. Ahead, no sign of the northern shores of the Banjao Sea appeared. Yet the sun was high; it must be around noon.

"Tell 'em to put their backs into it," said Barnevelt.

Chask replied: "They do what they can, sir, but lack of water robs their sinews of their accustomed strength."

The reckoning indicated that, though Palindos Strait were not yet in sight, it must lie not far below the horizon. Careful estimates showed that they could just nip through the strait ahead of the following ship.

Chask said: "Then shall we be in the Sadabao Sea, but what will that avail us? For yon cutthroats will fol-

low us even to the harbor of Damoyang."

"True," said Barnevelt, frowning over his chart. "How about running ashore and taking to the woods?"

"Then they'll put ashore too to hunt us down, and with hundreds to carry on the search there's little doubt in my mind of its outcome. What else would ye?"

"How about doubling around one of the headlands of the Strait and hiding in a cove while we're out of sight?"

"Let's see, sir." Chask pointed a stubby finger at the chart. "The eastern shore of the Sadabao Sea, along here, is rocky and hard to draw nigh to without staving your bottom. The westerly has some rock, much open beach, and few places to hide. Fos-sanderan may have such coves upon its northern flank, but never will ye persuade ordinary seamen to go ashore on that accursed isle."

"Oh, foof! Are they afraid of the mythical beast-men?"

"No myth, captain. At least I've heard the sound they say is the drums of these demons. And myth or no, the men would not obey."

Barnevelt went out again, to be greeted by a chorus of hoarse cries: "Water! Water, captain!" "Water, we pray!" "We demand water!"

The galley was crawling up once more. The wind had now ceased entirely save for an occasional light puff. The sail flapped limply, reminding Barnevelt of Chask's pre-

diction of a week's calm.

He gave orders to ration out the men's noon sip of water, which he hoped would quiet them. Instead they only grumbled the more for its paucity.

The galley was now all visible again, her oars rising and falling with mechanical precision now that the sea was comparatively smooth. The second galley, too, was closer.

A sailor in the bow called: "Land ho!"

There it was: a cluster of wooded peaks—the hills of Fossanderan. Barnevelt's little winged friend saw it, too, and flew off to northward.

Barnevelt went back into the cabin to correct his reckoning and lay his course for the eastern channel. Zéi watched him wordlessly with large dark eyes.

He ran over his estimates again. This time it looked as though the galley would overhaul them in the throat of the eastern channel of the Strait. Then why keep trying? The usual hope for a miracle. The galley just might spring a seam or have a mutiny at the last minute—

Too bad the western channel wasn't just deep enough to float the *Shambor*, so he could lure the galley onto the bottom.

Well, wasn't it? With the three moons in conjunction at full, Krishna would have record tides. And while the tides in these seas were usually nothing much, because of the limited size of the seas and the complicated tidal patterns engendered by Roqir and the three moons, on this

one occasion the tidal waves should all be in phase, producing a tide of Earthly dimensions.

Barnevelt got out the handbook he had bought from Vizqash at Novorecife. This included not only tables for computing the revolutions of the moons, but also a table showing by how much time the tidal waves caused by each luminary led or followed the movement of that moon in various places. Madjbur, Djazmuran, Sotaspé, Dur—Here it was, Palindos Strait. Barnevelt whooped when he saw that here Karrim's tide lagged behind that moon by less than a Krishnan hour, and the tides of Golnaz and Sheb by even smaller amounts.

"Chask!" he yelled.

Though Chask looked dubious, he had to admit that there was nothing to do but try the western channel, especially as they should hit it a little past noon, the best possible time—except for a little past midnight—from the point of view of the tides.

The *Shambor* swung to port and crept towards the channel while the galleys crept towards the *Shambor*. The wooded hills of the peninsula that came down to the Strait from the west now came into view. As they plodded over the glassy sea the land rose higher until it looked as though the island were part of the mainland. Then as they came still closer the western passage opened out.

Still the galleys lessened their distance. Barnevelt looked back with a shiver. Would they have to duck another barrage of bolts and bullets?

ASTOUNDING SCIENCE-FICTION

One of the sailors called out: "Tis no use, captain; we're spent!" Others joined the chorus of defeatism: "They'll take us long ere we reach sanctuary—" "Let's give up on terms—"

"Shut up, all of you!" said Barnevelt. "I got you out before—"

At that moment a sailor—not Zanzir, but an older and bigger fellow—began to harangue the crew: "This haughty captain cares nought for ye, but only for his royal doxy. Let's throw them to the fish—"

Barnevelt at the start of this speech drew his sword and walked towards the man, who, hearing his approach, spun round and reached for his knife—a movement duplicated here and there among the crew.

Barnevelt made his last two steps running, and before the mutineer could either stab or throw he struck the side of his head with the flat of his rapier. The man staggered sideways, across the deck, through the gap in the rail left by the galley's catapult-missile, and over the side. *Splash!*

Barnevelt had not intended to kill the man, only to stun him. But he was perforce becoming callous; they couldn't stop to pick the fellow up, and now they would know he meant business. He only regretted it hadn't been Zanzir, who was no doubt at the bottom of the trouble.

"Anybody else?" he asked the crew.

Nobody answered. He walked up and down the catwalk, peering at the rowers. One whom he judged to be

shirking he whacked on the bare back with the flat of his sword.

"Lay into it, you!" Me and Captain Bligh, he thought.

They passed a rock. Barnevelt said: "Chask, take the tiller. Put a couple of men in the bow to take soundings. I'll go aloft . . . oh-oh!"

"What, sir?"

"Our new rig has no ratlines. Get me a hammer, some spikes, and a length of rope."

Presently Barnevelt, his implements dangling from him, began to shin up the mast. It was a foul job, since all he had to climb by were the rope rings holding the luff of the sail to the mast, and these provided poor purchase. When he was about two-thirds of the way up he drove a couple of spikes into the mast and looped his rope from them to make a crude boatswain's chair. Though neither safe nor comfortable, he could now at least judge depths from the varying shades of green of the water ahead. From behind came the thump and splash of the galley's oars.

"A point to port," he called down. "Little to starboard. Steady as you go—"

Any minute the ship might touch ground, probably snapping him off his perch. He kept peering for patches of dark water. A slight tidal current through the Strait to northward helped the *Shambor* along.

When he found a good channel, he snatched a look aft. The galley was still coming up, also picking its way, and behind it a couple of hoda came

its sister-ship. The cries of men taking soundings in the galley drifted up to the *Shambor* like an echo of the calls of her own leadsmen in the bow, except that the figures were different.

Barnevelt concentrated on a bad patch, where pale-green shoals seemed to block his way completely.

A sudden outburst of yells came up to his ears: "She's aground! The pirate ship has struck!"

Ha, he thought, his scheme had worked. Still he dared not take his eyes off the water ahead. He'd feel foolish indeed if he lured the pirate aground only to strand himself a minute later.

A jerk of the mast told him the *Shambor* had touched, too. "Pull hard!" he shouted. "A hair to starboard!"

The oars dug in and the *Shambor* came free. Ahead lay all the dark-green water anyone could ask.

Barnevelt drew a long breath and looked back again. The galley was backing water furiously, the sea foaming about her oar blades. Behind her the second galley, in response to flag-signals, had turned to starboard and now showed her profile heading east.

Barnevelt guessed that the second ship had received orders to go around by the eastern channel and then try to catch the *Shambor* in the Sadabao Sea. Therefore it would not do to sail blithely on for Qirib as if their worries were over. Once the second galley sighted them in the open sea they'd be in the same fix as

before, without any shallow strait or north wind to rescue them.

What the *Shambor* needed was a hiding place where the water supply could be replenished. The men were not exaggerating their exhaustion; Barnevelt's own throat felt like something dug out of an Egyptian tomb. If his own sailors for superstitious reasons were afraid to land on Fossanderan, the pirates would probably feel the same way.

He told Chask: "Hard to starboard, and find me a cove on the north side of Fossanderan that might be the mouth of a stream."

"But, captain—"

"That's where we're going!"

Chask, shaking his head, swung the ship east. As they emerged into the Sadabao Sea the promontories of Fossanderan hid the stranded galley. The breeze freshened a little. Sailing with the wind on the beam they made good time along the rocky, wooded shores. After most of a Krishnan hour Barnevelt said:

"That looks like a good place; a little valley that ought to have a stream."

"Say not I failed to warn ye, sir," said Chask, and turned the *Shambor* shoreward.

At once the men—who had been very quiet since the mutineer had fallen overboard—set up an outcry: "The haunted isle!" "Our mad captain's taking us to the home of the demons!" "All's lost!" "He must be a demon himself!" "Anywhere but

that!" "We'd liefer do without water!"

Again Barnevelt faced them down, though the oarsmen relaxed their efforts until they were merely dipping their oars in the water. That, however, made little difference because the breeze wafted them shoreward.

"The first man who backs water without orders," said Barnevelt, "gets this. Zé! Come out; we're going ashore. Get out the buckets."

The *Shambor* nosed gently into the embayment until tree-branches swept the deck and swished against the rigging. Chask ordered the sail and the anchor dropped and hurried forward. Barnevelt dropped off the bow into knee-deep water and caught Zé as she climbed down.

He shouted: "Fresh water!" and pointed to where a little trickly stream spread itself out thinly over a small sandy delta.

The men scurried to the bow to leap off also, drink, and fill buckets for the ship's water tank, which they passed to others on deck. Although he was as thirsty as they, a quirk of vanity made Barnevelt hold off from drinking until everyone else had done so. He turned a grin to Zé:

"We'll tell old Qvansel his three moons did save our skins—not by occult astrological forces, but by the good old force of gravity."

Chask came ashore last. He walked up to Barnevelt swinging an ax and said: "I like this not, captain. We should all be armed in case the beast-men appear; yet with the crew in its present temper 'twould be folly

to serve out arms to 'em. Besides, we're low on stove-wood, and me—thought—"

Barnevelt said: "I haven't heard any spirits of the waste and weald moan—Hey, what goes on?"

In a concerted movement all the sailors rushed back to the *Shambor* and scrambled aboard. Before Barnevelt and Chask could even reach the ship they were hoisting the anchor and backing water vigorously. The ship started to move.

Barnevelt and Chask seized the anchor before it disappeared over the gunwhale and pulled on it, as though two men could counteract the thrust of fourteen vigorously wielded oars. Suddenly the tension in the anchor-rope ceased, and Barnevelt and Chask sat down with a splash. Somebody had cut the rope.

As Barnevelt sat foolishly in the shallow water, the *Shambor* receded rapidly, the sailors jeering: "Fare thee well, captain!" "May the demons give ye pleasant dreams!" And Zanzir, loudest of all: "We thank ye for the fine ship, captain; we'll make our fortunes in't!"

There was no use swimming after the *Shambor*, which backed out into open water, hoisted sail, and swung round to head off northeast, close-hauled. Soon she was out of sight, leaving Barnevelt, Zé, and Chask on the doubtful shores of the island of Fossanderan.

XII.

Barnevelt said: "I should have

run that young squirt through the first time he gave us a piece of his lip."

He wondered, now, what would happen to the *Shambor* in her new rig, which he had intended to change back to the old before reaching Damovang to avoid trouble with the *Viagens* over the introduction of an invention to Krishna.

"Nor should we have both come ashore at once," said Chask. "That last blunder was of my doing."

"Instead of apportioning blame," said Zéi, "weren't not more profitable to plan our next course?"

Chask said: "The princess is a fount of wisdom. The sooner we're off this accursed isle the sooner shall we be home. By the gods' own luck we have this ax and that length of anchor rope. I propose, captain, that we build a raft, utilizing trunks of trees and the rope to bind them. Then shall we paddle to the western mainland, and thence proceed to the Shaf-Malayer road, which runs not far west of here."

"Two logs is all we have rope for," said Barnevelt. "We'll have to straddle 'em as if we were riding an aya."

Chask found a likely tree and felled it. He was still trimming the glossy branches away when a hideous clamor arose from the woods around.

A swarm of creatures rushed out of concealment and galloped towards the three maroons. They were of about human size and shape, but with tails, heads faintly resembling those of Earthly baboons, and hair

in lieu of clothes. They carried stone-club and spears.

"Run!" screeched Chask. The three ran to the mouth of the stream and turned westward along the shore. The shore here took the form of a crescent-shaped beach, ending in a rocky promontory.

Barnevelt and Zéi, being taller than Chask, drew ahead of the boatswain as they raced along this beach, the beast-men howling behind. Barnevelt heard them gaining.

A sudden break in the noise behind caused Barnevelt to snatch a look to the rear. What he saw filled him with horror. Chask had stubbed his toe on a stone and fallen, and before he could get up again the beast-men had reached him and were working him over. Barnevelt checked his stride and reached for his sword before realizing that Chask must be already dead under the shower of blows and thrusts, and for him to go back would be to throw his life away to no purpose.

He ran on. At the promontory he and Zéi leaped from rock to rock until they found before them another short stretch of beach.

"Ao, Zéi!" he said. "In here!"

At the beginning of this curve of beach the waves had undermined the bank beneath a big old tree, whose roots now dangled barely from the overhang and whose trunk leaned seaward at an ominous angle. One good storm would send the whole tree crashing into the sea, but meanwhile the space beneath it formed a small cave.

The fugitives burrowed in among the rootlets, bringing showers of dislodged earth down on their heads and disturbing many-legged creeping things. One of the latter got inside Barnevelt's jacket and squirmed about while Barnevelt swatted frantically. In its death-throes it bit a crumb of flesh out of his chest, causing him to suck his breath in sharply in lieu of yelling.

When they were as far back as they could push, they found that they could no longer see the beach for the curtain of roots that hung down from the roof of their refuge like the baleen from the palate of a whale.

Well, thought Barnevelt, if I can't see out, they can't see in. How about footprints? Between the wet sand and the bank of which the tree formed a part there was a strip, not much over a meter wide, of soft dry sand, and they could hope that this would not betray them. They crouched in their hole, rationing breaths in an effort to be quieter than utter silence.

The noise attending the butchery of Chask died down, and bare feet trotted by *slap-slap* over the wet sand. Beast-men called to one another in their own tongue. For all Barnevelt knew they were organizing an attack on the cave, and any minute he expected to have to start thrusting at the bestial heads as the creatures came crawling into their refuge. He could put up quite a scrap—

Then all sound died away save the *swoosh* of the surf and the sigh of the wind. Nevertheless the fugitives continued to crouch for hours.

Barnevelt whispered: "Just like 'em to be waiting out there to greet us!"

When the dimming of the light at last showed that afternoon was well advanced, Barnevelt murmured: "You stay here. I'm going out to scout."

"Take care!"

"You're darn tootin' I'll be careful. If I don't come back by tomorrow morning, try to swim for the mainland."

He pushed his way out, centimeter by centimeter, like some timid mollusk emerging from its shell, ready to whisk back in at the least alarm. However he could neither see nor hear any trace of his enemies.

The tide, which when they had sought refuge was almost lapping the mouth of the cave, had now receded many meters. Barnevelt skulked back to the place where Chask had fallen. The sand was roiled and stained with brown Krishnan blood running down to the water in a broad band, but no bodies were in sight.

Barnevelt followed the feeming humanoid footprints back to the mouth of the little stream. A few meters up the stream, where lay the trunk the boatswain had felled, he came upon the ax Chask had been using, lying in the stream-bed with the water rippling over it.

Barnevelt pushed upstream looking for spoor of the beast-men. He

found broken bushes and blood from their burden, but the mold of the forest floor did not take footprints with any clarity, and soon the trail died out. Too bad, he thought, that he was not trained jungle-wallah.

While he cast about in perplexity a sound came to his ears: a rhythmic booming, too sharp and high for a drum of the conventional type, too resonant for mere banging on a log. At first it seemed to come from all directions. After a while of turning his head this way and that like a radar-antenna he thought he fixed its direction and struck off uphill to the southeast.

An hour later he knew he was nearing the source of the sound. He drew his sword, to have it handy and so as not to let it clank in its scabbard. Creeping stealthily over the curve of a rounded saddleback he looked down upon the scene of activity he was stalking.

On a level space, cleared of trees, the beast-men were dancing around a fire while one of their number pounded on a drum made of a hollowed log. Or rather, Barnevelt saw what he had supposed to be beast-men, but which now turned out to be ordinary tailed Krishnans, *Krishnантропус koloftus*, like those of the Koloft Swamp and the island of Zá. They had been wearing carved animal-masks when they made their attack, and had now removed these and hung them on stubs of branches around the clearing. And whereas the tailed men of Zá were semicivilized and those of Koloft had at least

been subdued by the authorities of Mikardand, the present examples of the species were carrying on their aboriginal traditions with full savage vim.

Across the fire Barnevelt was distressed though not much surprised to see parts of his late boatswain hung on lines to sizzle. While Barnevelt was uncertain of the identity of some of the organs—Krishnans being less human inside than out—there was no doubt about their eventual disposal.

Barnevelt swallowed the lump in his throat and started back.

Back at the hiding place, Barnevelt said: "I found him all right. They're eating him."

"How dreadful!" said Zéi. "And he such a worthy wight! What a bestial and abhorrent custom!"

"Too bad, but actually it's no different from what you do in Qirib."

"Not at all! How can you utter such blasphemous sophistry? Whereas as the one's a solemn ceremony, the holy powers above to gratify, the other's but the swinish satisfaction of the alimentary appetite."

"Well, that's how some people look at it. But let's not argue; let's get out of here. It's pretty far to swim, and we don't want to leave our clothes and weapons behind—"

"So why not finish the raft our slaughtered friend and deputy began?"

"Exactly, except that the sound of the ax will fetch 'em running." He sniffed the breeze. "The wind's



backed to the northwest, and we're on the northwest shore of the island. The woods look dry, and my lighter should be working."

"You mean to set the weald ablaze, to distract the tailed ones from our enterprise?"

"Matter of fact I'll set the biggest forest-fire you ever saw. Bear a hand, gal."

For the next hour they prowled the shore, piling sticks and dead shrubs where they would do the most good, until they had a line a hoda long running along the shore, bending inland at the mouth of the stream to afford room to finish the raft.

When that task was done, Barnevelt started at the east end of his line of bonfires and lit the first with his lighter. When it blazed up he and Zéi each thrust into it a torch of fag-

gots and ran down the line, igniting blaze after blaze.

By the time they finished, the whole slope extending inland was a roaring hell, the fire leaping from tree to tree.

Barnevelt, his face red from the heat, sweated over his raft. There was not much more to be done: to cut two logs from the felled trunk, shave these into the water, and tie them together with the piece of anchor rope. Then he felled a sapling and trimmed the soft wood of the trunk down to a couple of crude paddles—too narrow in the blade to be efficient, but not even the long Krishnan day provided time for a better job.

"Off we go!" he shouted over the roar of the fire, and drove the ax blade into one of the logs to secure

it for the voyage. Zéi straddled the logs forward. They paddled out from shore; the heat of the blazing hill-sides beating with blistering force on their backs. All of Fossanderan seemed to be red with fire or black with smoke.

The thick stems of the paddles were awkward; Barnevelt wondered if bare hands wouldn't have done as well. Every swell swirled up to their waists as they angled out from shore. When they were far enough to start west for the mainland the swells made their craft roll precariously. Meter by meter they struggled westward as the sun sank. The first stars were out when they came to the western channel of the Strait of Palindos — just as well, Barnevelt thought, for the stranded galley was all too visible from where they crossed the channel.

The galley sat with lanterns hung about her. The low tide had left her hull exposed down to the curve of the bilge, and the settling of her weight upon her keel had caused her to heel over at an undignified angle. Beyond her, a dark-red shape in the twilight where the fires of Fossanderan shone upon her, lay the galley's consort. Hawsers stretched in graceful catenary curves between the two ships; the banked oars of both rested quietly upon the water.

Evidently, thought Barnevelt, the second galley had made a cast into the Sadabao Sea, had either caught the *Shambor* or had given up looking for her, and had come back to try to pull her sister off the bottom. But

the dropping of the tide had stultified this project, and now they were waiting for midnight and high water to try again.

Peacefully he and his companion paddled across the channel. When all three moons arose, now more widely spread than they had been the previous night, the travelers grounded gently on the sand-spit projecting from the mainland towards the blazing island.

In the afternoon of the fourth day after they had touched the mainland, Barnevelt and Zéi came out of the woods beside the Shaf-Malayer road. Both were thin, dirty, worn-looking, and excessively shabby.

Barnevelt said: "I suppose we ought to start hiking north, but let's sit here a while and hope to hitch a ride."

He tossed his ax on the ground and sat down heavily with his back to a tree. Zéi dropped down beside him and laid her head on his shoulder.

He said: "Let's see the rest of those berries."

She handed over her seaman's cap, which she had been using as a bag. Barnevelt started fishing out berries, feeding them alternately to her and himself. He looked at one suspiciously and threw it away, saying:

"That's the kind that gave us a bellyache. Can't you just imagine the meals we'll have when we get to town?"

"Aye! A fine roast unha, with

tabids on the side, and a tunest in its mouth; the platter swimming in betuné sauce—"

"And a bunch of those yellow things—pokkanya, for dessert, and a big mug of falat-wine—"

"Not the falat of Mishdah, which is thin stuff, but that of Hodjur, especially that of the Year of the Yeki—"

"And a loaf of badr, to sop up what's left—"

She raised her head. "What a blade! Here you sit, with a most royal maiden all but lying in your arms, and all you think upon's your beastly stomach!"

"Just as well for you."

"How mean you?"

"There's no guardian of virtue like starvation. If I had my strength, you wouldn't be a maiden long."

"Braggart! Your thoughts would still center upon aliment. Oh, I saw the repasts you consumed aboard the *Shambor*, and knew your nation's gluttonous reputation were but a pallid phantom of the fact."

"It's a cold country," he said.

"But you're not cold now!"

"And at least we eat normal wholesome food, and not our husbands."

"The kashyó's no feast, but a solemn ceremony—"

"I've heard that before, and I still think it puts you on a level with the tailed men of Fossanderan."

"Insolent carper!" she cried, and slapped him—gently, to show it was in fun.

"And," he continued, "I don't see

how your royal line perpetuates itself if every time the consort finds the queen looking at him he wonders if it's the love-light in her eyes or whether she's picking out a nice chop. That sort of thing must be unmanning."

"Perchance our men are less readily unmanned than those of your land. A Qirib on the verge of death retains his gallantry, whereas put a Nich-Nyamé on berries and shellfish for three days—"

"Four!" interrupted Barnevelt.

"Four days, and he's blind insensible to aught but food."

"Fool! You were imagining just as big a meal as I was."

"I was not! The repast of your fancy overtopped mine as the Zogha overshadows Mount Sabushi."

"How d'you expect to prove that?"

"A princess royal has no need to put matters to proof. Her word alone is adequate."

"Is that so? Then you'd better learn some new customs. For instance, has that Earthly practice called 'kissing' spread to Qirib yet?"

"Among the wilder spirits of the land, I'm told, though none of our courtly circle has yet demonstrated it to me. Know you it?"

"Sure. It goes like this—" And Barnevelt tightened his arm around her and demonstrated.

"Hm-m-m—" she said. "Tis a pleasant pastime indeed, notwithstanding that my lady mother speaks of it in terms of righteous contumely. Again, I pray—"

After a while Barnevelt said: "I'm afraid I'm not so near starvation as I thought."

"So? Seek not to violate the ancient customs of Qirib, or you shall learn the rough-and-tumble methods taught by our lanistae to the maiden warriors' palaestra. Are you perchance carrying a gvám-stone in your pocket?"

"No; I'm relying entirely on my native charm. Speaking of your women warriors, I hope this experience has convinced you that manning an army with women—if you can man 'something with a woman—isn't practical."

"And what's the cause of that?" she asked.

"Because the men are bigger. If this were that planet where the females are ten times bigger, it would be different."

"Twas most unfair of Varzai this disparity to establish."

"Yes it was, if you take your deities seriously."

"Do you not?"

"No; I think things just happen. But it's a wonder Qirib hasn't been swallowed up by some powerful neighbor, with that setup."

"Our queens have averted war by a diplomacy of marvelous subtlety, using our mineral wealth to play one foe against another."

"Fine, but eventually some tough guy says 'Fight or give up!' and that's all the choice you have."

"Do you present *me* with these grim alternatives, you sciffin nihilist, fear not but that I'll fight."

"Oh, no; I'd use that marvelous subtlety you were talking about to gain my ends. As for instance—"

"Malapert!" she said when she could speak again. "Could you not remain at Ghulindé to play this glad-some game with me forever?"

"That depends."

"On what? Another, I command—"

"If your mother abdicates, your consort mightn't like it."

"He'd have nought to say; my word would be law."

"Still, it might be considered pretty familiar," he said.

"Well then, could you not teach the wight? Or better yet, become my first consort yourself?"

"No! You don't think I want to end up on your sacrificial stove, do you?"

She looked surprised and a little hurt. "'Tis an honor many you would envy. Art afraid?"

"Right! I like you fine, but not that much."

"Oh? Plain blunt fellows, Nich-Nyamen."

"Anyway I'm not eligible."

"That could be arranged," she said.

"And I thought your consorts were picked by lot?"

"That, too, were no obstacle insurmountable. All's not what it seems in the drawing of the sort."

"So I've heard."

Her eyes filled with tears. "You said you liked me, and we're really of one kind, you and I, despite our seeming differences exterior."

"So I do." He took time off to demonstrate the new game. "I'm madly in love with you. But—"

"I love you, too."

"As a man or as a steak? Unh!" She had punched him sharply in the short ribs.

"As a man, fool," she said. "At least a putative one, for the proof definitive has yet to be submitted."

"Well, that's something. And don't make cracks about my self-restraint, or I'm likely—"

"Hold, perchance there's a way out. Know you the agitation of the Party of Reform, to convert the execution to mere symbolism? Well, having seen a greater portion of the world and having heard the irreverent talk of yourself and other skeptics theological, I'm not so sure as once I was that the Divine Mother in fact demands this sacrifice."

"You mean you want to adopt the Reformers' program when you come to power?"

"Why not? Then you'd have no dire doom to dread."

"No," said Barnevelt firmly. "Look, sweetheart. In the first place your mother'll keep on running things, as you said yourself, even after she's abdicated, and I don't think she'd stand for such monkeying with custom."

"But—"

He placed a hand firmly over her mouth. "In the second, when I love a girl I want her permanently and not on a one-year lease. The idea of watching a parade of successors doesn't *ouch!* You little devil, are

you sneaking a snack in advance to see how I taste?"

"Nay, you mass of string and bone; I did but nip you gently to remind you that I, too, must breathe to live, and cannot with that great hand clamped upon my countenance. As for your theories of love and life, that's a view extraordinary for a wandering adventurer. Most such, I've heard, prefer a short hot love and a speedy departure."

"I'm different. In the third place I intend to be the boss and not one of your Qiribo househusbands. Which lets out your whole matriarchal system."

"If the women be housewives in the barbarian nations, why in equity should not the men be househusbands with us?"

"No reason at all, darling. If they put up with it that's their business. But I will not. Nor will I stand for being doped with that *janru* drug."

"I'd swear never to use it on you."

"How could I be sure of that? No, my dear, I'm afraid—"

"Are you already bound in wedlock? That condition has many cures: the legal mills . . . Are you? Answer or I'll tickle."

"If you do I'll spank. No, I'm not—" said Barnevelt, and then wished he had said "yes."

For he now saw what showing his genuine fondness for Zéi was getting him into. The real reason for his adamant refusal was the fact that they were of two different species. Yet, with Tangaloa in the clink, Shtain unrescued, and the Cosmic

contract unfulfilled, he did not yet dare admit his Earthly origin, knowing the parochial prejudices of many Krishnans.

"What then?" she asked with a dangerous gleam in her eyes. "To what extent must one my proud lineage abase herself before you?"

"You'll have to let me think," he stalled.

"You slippery equivocator!" She jumped up, gave him a sharp kick in the thigh, and started off. "The bigger fool am I, so to cozen me have let you! Here, sir, part our ways for good. I'll to Ghulindé alone."

She started walking briskly northward along the road.

Barnevelt watched her straight receding back with mixed feelings. On one hand he should be glad she'd broken off this dangerous and unprofitable game. On the other he was horrified to hear his softer self call:

"Come back, sweetheart! Let's not fight. What'll you do for money?"

She kept on. In a few seconds she would be out of sight around the next bend.

At the last minute, he put his hands over his mouth and imitated the grunt of a hunting yeki, with which they had become all too familiar during the last few days. He did not really expect it to work, and was all the more surprised when Zéi jumped into the air with a cry of alarm, dashed back to him, and flung herself into his arms.

"There, there," he said. "You

needn't be afraid with me around. Let's sit down again and take it easy."

"Concerning our future relationship, my love—" she began, but Barnevelt laid a finger on her lips, saying:

"I said I should have to think about it, and I meant that."

"I insist—"

"Darling, you've got to learn in dealing with men from outside Qirib that they won't stand for your insisting. I have decided we won't talk about that subject for a while."

"Oh," she said in a small voice.

"Besides, when we're practically starved to death is not time to make vital decisions."

"Food again!" she cried, her good humor fully recovered. "Said I not all Nich-Nyamen were gluttons? And now back to our game—"

Starvation or no starvation, Barnevelt thought it just as well for the ancient customs of Qirib that a few minutes later a shaihan-cart creaked up the road headed north. Instantly he and Zéi were on their feet thumping. The driver spat and halted his animal.

"Clamber aboard, sir and madam," he said. "'Tis long since the Mejrou Qurardéna has honored my poor slow vehicle with a commission, but your uniform is credential enough for me."

Barnevelt had almost forgotten he still wore the expressman's suit. No doubt the owner of the cart would bill the company for his mileage, whereupon a stench would arise, but

that was the least of Dirk Barnevelt's worries right now.

XIII.

The stagecoach to which they had changed in Alvid stopped at the border between Suruskand to the south and Qirib to the north. On the Qiribo side of the line was the usual Amazon guard, the usual inspection, and the usual warning that Barnevelt's sword would have to be wired up in accordance with Qiribo law.

"And now," said the customs inspector while a guard went to fetch the wire kit, "your names?"

Barnevelt—who had been teaching Zéi to play Earthly chess on a little folding set he had bought in Alvid—had not given the question of identification a thought. Therefore he simply answered:

"I'm Snyol of Pleshch, and this young lady is Zéi bab-Alvandi—"

"What?" cried the inspector, her voice leaping an octave. "So she is! Your altitude!" The inspector knelt. "We were commanded to watch for you."

Barnevelt started to say: "Oh, let's not make a fuss—" but the Amazon continued:

"Girls! *The princess is saved!* Light a fire in the smoke box, to send a signal-message to the capital! But your pre-eminentences cannot continue on in a vulgar noisome common carrier! Our dispatch-coach is at your service, and I myself will escort you. Descend, I pray. Your bag-

gage? None? What ignominy you must have suffered! Girls, hitch up the carriage; saddle up . . . let's see . . . five ayá. Vaznui, you shall command the post till my return. Rouse the second watch from their slothful beds and bid 'em don parade uniforms, with boot and lance for escort duty—"

Half an hour later Barnevelt found himself speeding toward Shaf in the back seat of the official barouche, with the top down. Zéi beside him, and the customs inspector facing them from the front seat, her knees touching theirs. The vehicle had a plain black-lacquered body with the royal arms in gold on the doors. A mere male drove the two oversized ayá, while the five customs guards, resplendent in purple and gilded brass, galloped before and behind. To clear the road when they approached a settlement the leader of these blew a shrill little silver trumpet.

Although this was both faster and less smelly than the public tallyho they had just quitted, Barnevelt was not altogether pleased by the change, for his intimacy with Zéi was now cut off. Besides, the accoutrements of the escort clattered so that one had to shout to be heard, and one had to breathe the clouds of dust the hoofs of those in front stirred up on the dry stretches. Finally Barnevelt had no escape from the chatter of the inspector, a female of gushy type. She garruled on about the gloom that had descended upon

the realm with Zéi's disappearance, and the unbounded joy that would now reign—

At Shaf, however, Barnevelt observed that most of the people went about their own immediate business as if that were much more interesting than the vicissitudes of royalty.

By frequent changes of teams they kept up their headlong pace, save when a rain slowed them during the afternoon. The second day after passing the frontier saw them winding along the road on the north shore of the Qirib peninsula, the same road on which the emissaries of the Moryá Sunqaruma under Gavao had ambushed Barnevelt and Tangaloa on their first approach to Ghulindé. This time, however, there was no interference. To the left crawled the emerald waters of Bajjai Bay; to the right rose the shaggy peaks of the Zogha.

Roirj was descending behind them when they came in sight of the capital of Qirib. Barnevelt had not seen Ghulindé from this angle, whence the colossal image of the god Qunjár showed his profile, brooding over the spired city on his knees like an overstuffed Buddha with a birthday cake in his lap.

To the left and lower lay the harbor of Dañovang. As it came clearly into view Barnevelt saw the harbor was crammed with shipping. Moreover most of the ships were war-galleys, making a much larger fleet than the modest navy he knew Qirib to possess.

"What's all that?" he asked the customs inspector.

"Know you not? Of course, I'm a witless wench, how could you? 'Tis the combined fleet of the powers of the Sadabao Sea, which our queen magnificent seeks to plat into a firm alliance for the extirpation of the scoundrels who've so grievously affronted us. She does but wait to be sure of the fate of my lady princess ere setting her marital machine into motion. Yonder lie the battleships of Madjbür, of Zamba, of Darya, and of other powers of the eastern Sadabao. Never since Dezful the Golden reigned in riotous ribaldry in Ulvanagh has the sea groaned beneath such armament."

"What kind of ship is that?" asked Barnevelt, pointing. "The galley with a roof."

The ship in question did indeed look like an enormous galley with a flat roof over it. The inspector giggled and said:

"'Tis a ship of Prince Ferrian of Sotaspé, who's ever dazzling the world with some new thing. One of his subjects has invented a glider of novel design, differing from other gliders in that 'tis propelled through the empyrean by engines pyrotechnic. This galley is adapted to bear a score of such devices on its roof, wherewith, 'tis said, he hopes to assail these pirates in their swampy home by flying over them and laping them with missiles."

Thinking back, Barnevelt remembered pictures of a type of Earthly ship called the aircraft carrier, which

dominated naval warfare in the Twentieth Century between the decline of the big-gun steam-driven ironclad battleship and the rise of the atomic-powered guided-missile ship. An aircraft-carrying galley, however, was a combination to stagger the imagination.

"But hold," said the inspector, "we must arrangements make for your arrival."

She called to the leading customs guard and gave her instructions to gallop on to the palace while the coach dawdled to give the queen time to get organized.

Thus when the barouche drew up in front of the palace, all the elements of a royal reception were present: Amazons with lances presented, trumpeters blowing flourishes, with the royalty of Qirib and its neighbors drawn up on the steps in glittering array.

Barnevelt glanced at his scarecrow garb, and his old shyness rose up and—he was sure—made his knees shake visibly. He'd hardly cut a fine figure before the gilded highnesses on the steps. But then, he thought with a faint grin, maybe that was just as well. In the weather-beaten expressman's suit and the battered and blackened silver helmet nobody could overlook him. He braced himself, helped Zéi down from the vehicle, and swept her up the steps.

Ta-raa went the trumpets. Barnevelt almost glanced over his shoulder to see if there wasn't a movie camera on a boom dolly hovering

behind him, so kinematogenic was the scene. Then he remembered the camera on his own finger, and pressed the stud as he advanced toward the queen. A few paces from Queen Alvandi in the front rank, George Tangaloa flashed him a wink, while moving his fist in a way that showed that he, too, was filming the performance.

Barnevelt knelt to the queen while the latter embraced her daughter, then rose at the sound of Alvandi's stentorian voice:

"... inasmuch as our state, in accord with its divinely ordained institutions, does not possess an order of knighthood, I cannot confer it on you as a token of the favor and esteem in which I hold you, General Snyol. I do, however, hereby confer upon you honorary citizenship in the Monarchy of Qirib, with full rights appertaining not only to the male but to the female as well; together with a draft upon our treasury for fifty thousand karda. Now let me present you to these lords and princes gathered here: Ferrian bad-Arjanaq, Prince Regent of Sotaspé; King Rostamb of Ulvanagh; President Kangavir of Suruskand; Sofkar bad-Herg, Dasht of Darya; Grand Master Djuvain of the Order of the Knights of Qarar of Mikardand; King Penjird the Second of Zamba..."

Having tucked the draft into his jacket, Barnevelt tried to impress on his memory the long roll of names and faces. The first Krishnan whose thumb he grasped, the famous

Prince Ferrian, proved a youngish-looking fellow of middle height, slim, swarthy, and intense-looking, wearing a cuirass of overlapping plates, of black-oxidized steel damascened with gold. Next came Rostamb of Ulvanagh, big, burlly, and wearing a staggy caricature of a beard, who looked at Barnevelt with dour intentness. After that, however, the unfamiliar names and faces merged into one big confusion in his mind.

The queen was speaking again: "Where's Zakkimir, Master Snyol?"

"I don't know, your altitude, but I fear the worst. We got separated while they were chasing us in the Sunqar."

"A woeful loss, but we'll keep

hope for the nonce. Let's within, to restore your tissues before the banquet."

Banquet? Barnevelt feared there'd be speeches, and after all his narrow escapes from death it would catch up with him in the form of acute boredom.

They filed into the palace and were passed mugs of spiced kvad. Barnevelt had his thumb wrung by admirers until he thought it would come off. He couldn't get near Zéi who, still in her seagoing rig, was surrounded by the gilded youth of the land packed four deep.

The President of Suruskand, a stout little party in horn-rimmed spectacles and vermillion toga, aston-



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ished Barnevelt by producing a little native notebook and a pen-and-ink-well set from the folds of his garment, saying: "General Snyol, since my elevation has my eldest chick besought me to exploit my station to gather for him autographs of the great. So, sir, if you'd not mind posing your signature hereon—"

Barnevelt laboriously indited a series of Gozashtandou curlicues upon the proffered sheet.

President Kangavir looked at the result. "Whilst I hesitate to plague you further, sir, could you be so generous as to add thereto your signature in your native tongue?"

Barnevelt gulped, for he did not know how to write Nich-Nyami. After staring blankly for a few long seconds he scrawled "Snyol of Pleshch" in ordinary English long-hand. Luckily the little president seemed to see nothing amiss.

"Excuse me, your beneficence," said Barnevelt, and tore himself away. As Zéi had disappeared he went over to speak to Tangaloa, who was quietly swilling his drink and waiting. The xenologist wrung his hand, saying:

"My, cobber, but you resemble a swagman!"

"You would, too, if you'd been with us. When did she let you out of pokey?"

"As soon as she got word by that smoke-telegraph thing that you and the Sheila were safe."

"How's your arm?"

"Nearly as good as new. But you're the lad with things to yarn

about. Let's have the dinkum oil."

Barnevelt gave a synopsis of his adventures. When he told of setting fire to Fossanderan he was surprised to see Tangaloa's good-humored face take on a look of stern disapproval.

"What's the matter?" he said.

"That was a hang of a thing to do! Think of all the good timber you destroyed! On Earth we have to watch every stick of it. And what happened to the tailed men?"

"How should I know? Maybe they got roasted. Maybe they swam over to the mainland on the other side. What about them?"

"Why, there's a whole culture-group that has never been investigated. They sound like the same species as those of Kolof and Zá, but the culture may be quite different. These groups are all enclaves of the tailed species that were left when the tailless Krishnans overran the country thousands of years ago. Perhaps our hosts here derived their cannibalism from the tailed aborigines they displaced. Oh, there are all sorts of possibilities—or there were until you burned the evidence. How could you, Dirk?"

"Jeepers!" cried Barnevelt. "What d'you expect me to do, let these bloody savages eat me so you can come along later with your little notebook to study 'em?"

"No, but—"

"Well, it was them or us. As for the trees, Krishna's only got a small

fraction of Earth's population, with three or four times the land area, so we needn't worry about its natural resources yet. Tailed men, foof!"

"You don't understand preliterates," said Tangaloa in his lecture-platform manner. "Usually this savagery, as people call it, is merely a protective reaction to the treatment they've had from so-called civilized folk. It was that way four hundred years ago with my own people in the Pacific. A shipload of Europeans would land to rob and murder and kidnap, and the next boatload wondered why they were speared and eaten as soon as they came ashore. Probably those Fossanderans had been raided by slavers."

"So what? What could I have done?"

"You could have told 'em—"

"I don't speak their language, and even if I had those bleeps would have whonked me first and asked questions afterwards. Matter of fact that's what they did to poor old Chask."

"But when I think of the scientific data 'going to waste—'"

"If there are any left when we finish our job, you can go down to Fossanderan and interview them in the most enlightened anthropological style while they stew you in the tribal cauldron."

"Speaking of which, how much film did you get?"

"Not enough. We were just there overnight, and after I got away I hardly gave the Hayashi a thought until now. I have some exposed rolls

in my pocket, if the water hasn't gotten into the capsules. But what'll we do about Igor? He'll have to be taken by force."

"That will take care of itself," grinned Tangaloa.

"How d'you mean?" said Barnevelt uneasily.

"The queen is pushing you for commander-in-chief of this expedition against the pirates."

"Me? Why me?"

"Because you're a famous general, if you've forgotten. As you're from a distant country she figures these temperamental skites might agree on you when they wouldn't let one of their own group lord it over the rest. Penjird is jealous of Ferrian, Ferrian is jealous of Rostamb, and Rostamb is jealous of everybody."

"But I'm no admiral—"

"They'll never know that if you don't tell 'em. Here they have been beating their brains out to think of a way through the sea vine, and you've solved it."

"You mean my skis? Maybe—"

Barnevelt hesitated. On one hand the expedition would furnish a good excuse to get clear of Qiribe before he fell so deeply in love with Zéi that his will power could no longer extricate him. Besides, something had to be done about Igor Shtain and the Cosmic Features contract. On the other hand his old shyness filled him with dread at having to stand up in front of hordes of strangers and shoulder vast responsibilities to

which he was unequal.

"Of course it is all nonsense," said Tangaloa. "If Castanhoso had given me the name he gave you, I should have been chosen admirallissimo instead of you. As it is, having no military ambitions, I will happily shoot film while you wrestle with logistics."

The flash of jewels in the gas-light caught Barnevelt's eye. Here came Zéi, freshly scrubbed and waved, in gauzy tunics and glittering tiara, dodging through a scrimmage of painted youths towards himself and George. Barnevelt whistled his admiration and quoted:

"Let never maiden think, however fair,

She is not fairer in new clothes than old!"

"What's that, my lord?" she said, and he translated.

She turned to Tangaloa. "Does he narrate our adventures, Master Tagde? The telling could never in a millennium do justice to the doing, for compared to our struggles were the Nine Labors of Qarar as nought. Has he told you of the time, after we attained the mainland, when we were treed by a yeki? Or again how, after his lighter broke down, he made a fire by rubbing sticks together?"

"No; did you?" said Tangaloa.

"Yes; the Boy Scout handbooks are right. It can be done if you have dry wood and the patience of Job. But I don't advise—"

"What's a boskat ambuk?" asked Zéi.

"A Boy Scout Handbook?" said Tangaloa. "The national encyclopedia of Nich-Nyamadze. Did you make a bow-and-arrow, Snyol?"

"No. I suppose I could have in a month, with nothing else to do, and a couple more months to learn to shoot it. But we'd have starved to death. There's nothing to eat on that peninsula except berries and nuts and the creeping things we found under stones along the shore." Barnevelt shuddered reminiscently. "And at that we had to take only a tiny taste of each kind of thing at first to find out which were poisonous." He glanced at the clepsydra on the wall. "I'd better get dressed:

"The Bird of Time has but a little way
To flutter—and the Bird is on the Wing."

As guest of honor, Barnevelt had the seat on the queen's right, with Zéi on her left looking like one of the gauzier Greek goddesses. The rest of the company ranged in a crescent, jewels gleaming in the gas-light.

There were speeches, as Barnevelt had feared: one dignitary after another getting up and—often in a dialect Barnevelt could hardly understand—saying nothing with all the eloquence and elegance at his command. As Admiral Somebody from Gozashtand launched into his speech, the queen spoke to Barnevelt in a whisper that must have carried to the kitchen:

"I'll break this up early, so that the council-meeting shall be started. Dost know that the staff of command's to be thrust into your grip tonight?"

Barnevelt gave a polite but inarticulate murmur, and said: "Is there anything you want me to do to clinch it?"

"Just keep your big sack of a mouth tightly shut and allow me to manage matters," the queen replied graciously.

After the banqueters had been dismissed, the council-meeting assembled in a smaller chamber of the palace. There were about a dozen present: all head men and high military officers of the neighboring states.

First the Gozashtando admiral, in a long speech, gracefully explained why his imperial master, King Eqrar, could not join the alliance because he was in the midst of negotiating a treaty with Dur, and . . . ahem . . . everybody knew what that meant.

"It means your royal niggard will endure piracy and pilferage rather than sacrifice some piddling commercial advantage," said the queen, "whereas if he could see beyond that beak of his he'd know he stands to lose tenfold as much from unchecked lawlessness. Unless in plain poltroonery he fears Dur'll assault him for clipping their furacious frenzied claws."

"Madam," said the admiral, "I cannot permit such contumelious

gibes towards my master to pass unrebuked—"

"Sit down and shut up, or take the road back to your craven king!" yelled Alvandi. "This is a meeting of warriors, not of palsied recreants! Whilst we face the foe with what we have undaunted, he sits on his fat podex in Hershid with more force at his command than all of us together, but trembling in terror lest a bold move cost him half a kard. He makes me sick."

The admiral gathered up his papers, bowed stiffly, and walked out without a word. When he had gone, Prince Ferrian flashed the queen a sardonic grin.

"That's drubbing the old runagate!" he said. "No wonder the women rule in Qirib. Of course, had we frontiers in common with Dur, as has Eqrar of Gozashtand, well might we sing a less temerarious tune. Howsomever, let's to business."

"Right are you," said Alvandi. "Here upon my right sits he of whom I told you: the hero who has penetrated to the Sunqar's heart and lived to tell the tale. General Snyol, tell these lords in brief how you rescued my daughter."

Barnevelt gave a condensed account up to the incident of the improvised skis, then asked: "Do you know what skis are?"

All looked blank save Ferrian, who said: "I do. We had a Nich-Nyamē in our islands last year who

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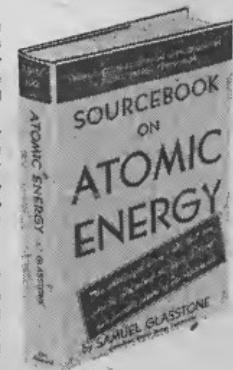
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showed us how to shape boards for walking on soft stuff. Having none of that strange frozen rain called 'snow' in sunny Sotaspé, we coated a hill with fine wet clay and slid adown it. I blacked an eye, and bent an ankle so that for a week I walked on crutches, though the sport was worth it. Is that how you escaped? By striding over the terphala on these contrivances?"

"Yes. You see I took some boards and whittled—"

"I see it all! We'll equip our entire battle with skis and send 'em forward over the vine, while the silly Sunqaruma look on in amaze, having thought themselves impregnable in their marine morass. I'll take the training and command of these troops, and tomorrow set all the carpenters in Ghulindé to carving skis!"

"No!" cried King Penjird. "While we all know you for a man of impetus and soaring spirit, Ferrian, yet never shall you command my soldiers!"

"Nor mine," said Rostamb of Ulvanagh. "Who's this young rashling who'd upset the tried and proven principles of war? I was commanding soldiery ere he'd broke the shell of's egg!"

"Quiet, sirs," said Queen Alvandi. "For this selfsame reason have I inveigled hither this ugly wight from far fantastical lands of cold and ice. His worth's already demonstrate, by his known repute in deeds of dought and by his recent solitary foray—"

"I care not," said Penjird of Zamba. "Be he a very Qarar returned to the mortal plane, yet shall he not command my men. They're mine, recruited, trained, and paid by me through all vicissitudes, and none but me they'd trust. I am who I am!"

"I crave pardon, lords," said the Chief Syndic of Madjbur, whose plain brown suit contrasted with the gaudiness around him. He went on quietly: "Most of those here hold their authority by hereditary right or lifelong tenure. To accommodate yourselves to the interests and desires of other men is not your habitude. Yet without a single head, an expedition such as ours is doomed to prove abortive, as those versed in the lore of war can readily confirm. Therefore, if we'd sink our shaft in the pupil of the shaihan's eye, must we all our independence compromise, as we who politick in states of rule elective learn to do habitually. And for that purpose, who could better leader be than this one—a man of force and craft from distant lands, having no local ties to sully his disinterest?"

"Right, old money-bags!" said Ferrian. "While I'd liefer lose a tooth than lessen my authority, yet do I yield to your logic's overriding force. Will you stand with me in this, Penjird, my lad?"

"I know not; 'tis without—"

"Not I!" roared Rostamb of Ulvanagh. "How know we Snyol of Pleshch has truly earned the reputa-

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tion that is his? Tales shrink not in telling, and we know him but by rumor that has wafted halfway round the globe. How know that he'll prove impartial as contends our friend from Madjbur? For some substantial time has he frequented Qirib's court, and how know we what secret offers or relations bind him to the douri's interest?" Rostamb looked hard at Zéi. "For that matter, how know we he's the authentic Snyol of Pleshch? I should have thought the General Snyol an older man."

Queen Alvandi whispered behind her hand to Barnevelt: "Tell the old *fastuk* you left your papers in Nyamadze, and challenge him for unfaming you!"

"What? But I—"

"Do as I command! Challenge him!"

Barnevelt, unhappily realizing that who rides the tiger cannot dismount, rose and said: "My means of identification were left behind in my native country when I fled. However, if anybody wishes to press a charge of lying against me, I shall be glad to settle the question privately, as one gentleman to another."

With that he whacked the council-table with his sword, making the ash trays dance. Rostamb growled and reached for his hilt.

"Guards!" shripled the queen, and Amazons leaped into the room. "Disarm these twain! Know you two bibracious recusants not the law?" This only in deference to your rank that

TO BE CONCLUDED.

ASTOUNDING SCIENCE-FICTION

we let you come armed within our purlieus at all, and any further swinish male brawling shall result in heads bedizening the city wall, though they be royal ones. Be seated. My lord Ferrian, meseems your head's the levelest of those here; continue your argument—"

For hours they went round and round. First it was only the queen, Prince Ferrian, and the Chief Syndic for Barnevelt. Then they won over the President of Suruskand, then Penjird of Zamba, and little by little the others until only Rostamb of Ulvanagh held out.

King Rostamb snarled: "You're all bewitched by that perfume the harridans of Qirib use to subjugate their miserable men. When I came hither I thought 'twould be a fair and open enterprise 'mongst comrades and dquals, 'stead of which I find a most nefarious palpable swindle whereby Alvandi hopes to gain control not merely of the Sungar as she does openly admit, but also of all of you, to impose upon your hapless lands her own perverse iniquitous dreams of female rule. To Hishkal with't; before that, I'll see the bloody flag of the Sunqaruma flying over golden Ulvanagh. You'll see I'm right, sirs, and meantime I bid you good night."

Out he went, his bristly chin in the air. The impressiveness of his exit was impaired by the fact that, not watching where he was going, he tripped on a fold in a rug and fell flat on his face.

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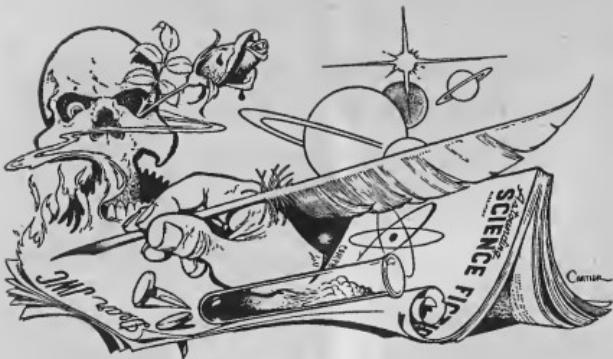
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BRASS TACKS

Dear Sir:

I am writing to comment on the article by L. Ron Hubbard on "Dianetics." After reading it I am very confused. It sounds very much like the kind of talk I hear from some of the patients in the mental hospital where I am taking psychiatric training. Mr. Hubbard has written a long article full of repetitious references to hypnosis, electro-shock, and insulin treatments, with occasional horrified references to transorbital lobotomy.

He has not bothered to say what dianetics is, how it works, how many people it has been used on, what the technique is, or what results have been accomplished with it. Instead, he rambles on in a confused way

about established techniques, which, though they have limitations, are helping to restore to health a great many persons with mental diseases.

The real danger in such articles is that readers with real mental diseases will first, be frightened away from recognized effective treatments, and second, that they will waste precious time on whatever-dianetics-is when they should be getting proper psychiatric treatment. Many mental diseases, like cancer, can be arrested with psychiatric methods if they are treated early, but are hopeless after the disease has progressed.

I am not planning to buy the book on dianetics, as I am sure it is probably as confused as the article.—J. S. Horan, M.D., 1120-C Pendle-

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As to those "recognized effective treatments": Official statistics show that fifty percent of all the hospital beds in the country are occupied by mental cases. In addition, of the remaining fifty percent, doctors have said that seventy percent of all physical ailments stem from psychosomatic causes. In view of these statistics, my personal feeling is that I can accept the term "recognized treatments" but not the term "recognized effective treatments." I want to point out, too, that while prefrontal lobotomy is recognized, and certainly effective, it treats "intractability," something which bothers the psychiatrist, not the insanity which bothers the patient.

—

Dear Mr. Campbell:

I enjoyed the article by J. J. Coupling on the construction of a thinking machine. It brought to mind an article I had read some time ago—which I can't find now—about a mechanical "turtle." It was a robot which was equipped with wheels as a means of travel and photoelectric cells by which a hunger, or desire for light of a certain intensity was imparted to the "turtle." Its power source was a battery hooked into its photocells in such a way that when it became weak, the robot experienced a desire for high-intensity light which was provided for it in a box.

The box was equipped with electrical contacts to charge the battery as the robot entered.

Now, if a more complex robot could be built, perhaps with a desire for a certain intensity light, a certain temperature, and perhaps a certain musical tone, all of which were of equal importance to it, what would happen if it was released in an environment where the three desires could be fulfilled, but not at the same time. It would have to decide which was more important, which would be impossible, since the desires are built into its as being of equal importance. Result: maybe a neurotic robot, or would it just sit and pine away until its batteries were discharged and it would be at last free in death. Or, if complex enough, it might develop into something like the Ermesians in Bernard Kahn's novelette, "A Pinch of Culture." Maybe the day of mechanical watchdogs has at last arrived.—R. L. Paul, 4113 E. San Marcus Street, Compton, California.

Like the donkey between two haystacks?

—

Since Dorothy and I will be in a state of collapse after the Norwescon, we thought we would take a few minutes on de Camp and "Why Do They Do It?" while our nervous systems are still intact. We are stf writers, but I putter around with transmitter circuits, use my slipstick

for money, and have brought home the bacon by being an analytical chemist. So . . . I guess I'm qualified to stick my neck out.

I have no patience with the "hoax" but I have less patience with the "explained hoax." This is a *howler* which is put forward by a lazy or incompetent investigator in lieu of sound thinking and investigation. It goes something like this:

"I don't see any reason for not denouncing this electroencabulator because it manifestly violates known scientific law, although I don't see how it works. It could be run by compressed air—or maybe it's mass hysteria. Yes, that's it! Mass hysteria."

I don't mean L. Sprague de Camp. But I wonder if de Camp hasn't been the victim, not of a hoax, but of a *hoax prime*. Let's call them H. and H'.

Keely's motor may have been, and probably was, a hoax. But there have been three H' explanations. De Camp gives one. Another was that the machine was operated by hydraulic pressure generated in an adjoining room or house and the fluid conveyed to the machine through hollow wires. Keely was presumed to have filed these wires which supported his machine in order to show that they were solid, always stopping before he reached the hollow center. One august scientist postulated that the motor was operated by internal magnets, or in other words, Keely's machine operated not from vibratory ether, but

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was merely a perpetual motion machine.

On the basis of this evidence, I judge that Keely's motor has not been proved a hoax because certain over-zealous investigators pulled an H' and left us with conflicting evidence and the important point clouded, perhaps forever. If Keely was the "yuk" they claimed—and he probably was—what a disservice science has been done by two or three equally ungodly characters who have left a reasonable doubt because they had to manufacture an explanation instead of using a little sweat to dig out the facts.

I dug up an Abrams' machine over ten years ago and took it apart. What I found inside compares in no way with the description given by de Camp. I found a low-frequency square wave generator operated by a solenoid moving a weighted cam contactor, a rectifier and filter, and a low-pass filter. The output was somewhat rounded off from the true square wave and elementary AC theory states that the square wave is composed of about Aleph-null number of sine waves. The output is certain to have some effect on the body but in place of having a clear-cut analysis of what this horrendous device could do, a bunch of pot-bellied gut-buckets open one up in court and find only a jumble of wires. Again there is a reasonable doubt because the machine was never tested under laboratory conditions and as a result, it's still going strong.

Now for Dinshaw P. Ghadiali:

This little Parsi has been the subject of a good deal of deCourte time and money. I have had a Spectrochrome Normalizer in my home. I have read the court records of the two trials and the hearing. I have studied his predecessor, Babbitt, and unhappily I can't yet say that he is a fake. As nearly as I have been able to work it out, there is a fundamental premise which neither Ghadiali nor Babbitt mention which is that emission of quanta from a given element, say the cadmium red line, is an evidence of energy transfer. The reverse, the addition of this same fraction of the spectrum to a reaction involving cadmium, should theoretically increase the speed of the reaction or act in a sense like a catalyst. Thus far I have found in my limited experimentation such to be the case. The increase is slight and if we are to prove anything, it must be determined quantitatively in an actual living organism, possibly using tracer atoms of radioactive sodium. Since I cannot do this, and since no one else is willing, the file folder on Spectrochrome Institute, Malaga, New Jersey is incomplete and I must in all honesty say so.

To be sure, I could go on citing cases and evidence ad nauseum but these three serve as examples and there are few who will dispute that science is committing a tedious harakiri by failing to nail down these items with the completeness that it uses on other phenomena. What, for example, do we do for ourselves when we nail down or to be more

ASTOUNDING SCIENCE-FICTION

exact, temporarily thumb-tack some feature of Fort's work when there are patently dozens of others left hanging? How do we increase our stature by dismissing Keely as a proven fake when some theosophist can come up with the aforementioned contradictory disproofs and quite honestly accuse us of partisan interest and a lack of the true scientific spirit?

If we don't slaughter our own sacred cows, they'll be butchered before our eyes and perhaps our reputations along with them. For example, what of the Bates system of eye training? The controversy between Dr. von Arlt and Dr. Helmholtz is

not dead, but science favors Helmholtz. What kind of science is this which leans toward a belief? I have done the obvious thing as suggested and dissected an eye and I cannot determine any way in which the lens structure can be altered for focusing purposes but I can easily see how the eyeball itself may be shaped by the external rectus muscles. Until a better dissection is presented to prove otherwise, I must say that von Arlt is correct. And yet we have an entire industry dedicated to weighting the bridge of our nose and pinning down our ears with optical refractive devices on the premise that

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Under the present circumstances, I cannot look to the science that I follow as being pure for I find in it evidences of youthful and mature peccadilloes, indiscreet attempts to economize on thinking, a few dogmatic acceptances of facts unproved and even a few that are tentatively untrue. I would not dare accuse another of being an H when I'm not sure that my own kind are not H'. I'm not even sure that the foregoing is free from H'. It's as free as I can get it.—John E. de Courcy, Box 1945, Troutdale, Oregon.

The trouble is, each investigator satisfies himself—and quits. The item then tends to remain in the hoax class unless men other than the originator can, by actually following the originator's directions, build a Keely motor—or what have you—that works.

—

Dear Mr. Campbell:

A few comments on Millard Perstein's letter in the current ASF:

He brings up the old clock paradox—if A is on a spaceship traveling nearly at the speed of light, his clock appears to be slow according to the observers on Earth, while at the same time the clocks on Earth appear to be slow according to the observations of A. How, then, can they get together and agree when A returns to Earth?

This is not a trivial question, and

is not to be found answered in most books on relativity. However, the problem is discussed on page 194 of "Relativity, Thermodynamics, and Cosmology," by R. C. Tolman.

The key to the paradox is that the spaceship and Earth are not symmetrical—they cannot be treated on an equal footing. The ship must accelerate to its outward velocity, then reverse its direction, and finally decelerate to rest on Earth. In doing this, it experiences forces which are not experienced by Earth. This removes the symmetry of the situation, for the effect of these forces must also be considered.

The presence of accelerating forces means that the problem cannot be handled simply by the methods of Special Relativity. We must introduce the ideas of General Relativity. Special Relativity applies to frames of reference moving at constant velocity with respect to each other. General Relativity takes into account the presence of forces and accelerations and describes the effect which these forces have upon the clock in the ship and on Earth.

When you go through the mathematics—which you can find in Tolman—you find that everything comes out all right in the end: no matter which you consider the moving body, the people in the ship find that it took them less time to make the trip than the people on Earth did.

Also, because of the Lorentz contraction, the people on the ship think that they covered less distance than do the people on Earth. In other

words, say the ship travels to Alpha Centauri—four light-years distance—in such a way that the observers on Earth think the trip took nearly four years, but the observers on the ship think it took one year. Then the people on the ship will believe that they traveled only a distance of one light-year. This all works out nicely so that both the people on Earth and on the ship observe the velocity of the ship to be nearly one light-year per year! Which is as it should be.

It means, furthermore, that the universe actually appears smaller to people traveling with these high velocities. Smaller as far as distance to be traveled is concerned, at any rate.

As to the practicability of this sort of thing, that is another story. Mr. Perstein's calculations concerning the distance and acceleration seem to be essentially correct. (Although the use of "subjective" and "objective" measurements is to be deplored; the time and distance measured by the people in the ship is just as objective as the measurements made by the people on Earth.) There is, however, a much simpler way of looking at the matter.

Assume, first, that the ship must carry its own fuel—it is a self-contained system. Then, no matter what happens, the mass of this system must remain constant. Now, suppose the ship reaches a velocity such that one year on the ship equals one hundred years on Earth. The mass-in-

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crease equation contains the same factor, so that the mass of the ship must be one hundred times its rest-mass. But since the mass of the system must be constant, this increase of mass must come from the conversion of fuel into kinetic-energy-mass.

In other words, even if you have a theoretically perfect space drive—one that "pushes against space" without the use of rockets—you must still carry an initial rest-mass to final rest-mass-ratio of 100 to 1. That is, if you start with a 100-ton ship, it still has a mass of 100 tons at 0.99995 times the speed of light, but 99 tons of fuel has been burned up and converted into kinetic energy now possessed by the one remaining rest-ton of ship.

Using a rocket, even with an exhaust velocity approximately that of light, makes the situation twice as bad—a mass ratio of 200 to 1 is necessary. This, now, is merely to get the ship up to speed. An equal amount of fuel is necessary to decelerate, meaning that the total mass ratio for the first case is 10,000 to 1, and 40,000 to 1 for the second.

It would seem, then, that travel at close-to-light speeds is rather impractical unless you have one of these convenient gadgets which collects cosmic energy while you are moving along.

It seemed a pity that Hubbard, while trying to write a story which emphasized so strongly the relativistic effects of fast travel, had to fall into the trap of talking about the

ship which got up to the speed of light and got stuck.

Now if you are trying to write a story illustrating a scientific principle, then you should illustrate it accurately. If you are writing about relativity, then carry it through to its logical conclusion. It is meaningless to write a story in which the principle of relativity is treated accurately, and then dump in the piece about the ship which got stuck at the speed of light. This is one thing which is definitely ruled out if you accept the remainder of relativity.—Milton A. Rothmán, 1825 N. Park Avenue, Philadelphia 22, Pennsylvania.

But if we have that space drive, can't we assume a "space brake" that will reconvert kinetic energy to fuel? We still need that 100 to 1 ratio, but not 10,000 to 1.

Dear Mr. Campbell:

First I want to say that I find your magazine by far the best of any in the field of science fiction. I especially enjoy those stories which are based on consequences of Relativity.

In the September 1950 issue you printed an analysis in Brass Tacks by Mr. Perstein of the Lorentz-Einstein transformation of Special Relativity as applied to space travel. Mr. Perstein mentioned the following paradox: Space travelers who return to Earth find that they have not aged as much as those who remained on Earth when according to the Special Theory of Relativity not only

are the clocks and life processes of those aboard the ship slowed down relative to an observer on Earth, but the clocks and life processes of those on Earth are slowed down relative to an observer on the ship.

First of all the Special Theory of Relativity is only concerned with coordinate systems that move with constant velocity relative to each other. From the viewpoint of Special Relativity it is impossible for two coordinate systems to be brought together so that the observers can decide which system was actually in motion. In the case of the spaceship returning to Earth, the ship had to accelerate on leaving Earth and decelerate on returning to Earth. Now when acceleration enters the picture

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slowing down and that B's measuring rods are shortening. After a year has elapsed by A's time, B returns. However, B insists that he has not been gone a year but just six months. The following is a conversation between the two physicists concerning their respective observations:

A. While I remained here at rest, your ship moved away accelerating rapidly. Your ship was a forbidden co-ordinate system in which the laws of nature were not valid.

B: Nonsense, my ship was just as good a co-ordinate system as yours. I maintain that I was at rest and that you were in motion.

A. But how do you explain the inertial effect of acceleration? You must have felt a force pushing you toward the rear of your ship.

B. When I turned on my rockets a strange gravitational force started pulling on my ship opposing my rockets. The more rocket power I used, the stronger the gravitational force became. I merely remained in the same position and the force I experienced was that of gravity.

A. Why is it that I didn't notice this gravitational force?

B. You didn't turn on your rockets so you were falling freely in the gravitational field and as far as you were concerned it didn't exist. The gravitational field was changing position so my ship turned on its axis and your ship described a huge ellipse finally returning to my position.

A. But if I was moving relative to you, how is it that my clocks didn't

slow down according to Special Relativity.

B. The strong gravitational field warped my measuring sticks and caused my clock to go slower relative to you. Since you were falling freely in the gravitational field, it was nonexistent for your system and did not slow your clocks. Remember that Special Relativity does not include gravitation or acceleration, but General Relativity shows that it is acceleration or gravitation which causes rods to shorten and clocks to go slower. When a body falls freely in a gravitational field, although the body is accelerated, the inertial effects of the acceleration such as the slowing of clocks are canceled by the gravitation.

I hope that the above discussion will suffice to make clear that there is really no paradox involved when space travel is viewed in the light of General Relativity.—E. P. Peltier, P. O. Box "A", Monrovia, California.

Well, it's a fine discussion. Here's one, though, to figure: A noon signal sent from Washington by radio is used to set a clock on a spaceship at the local spaceport, and also sets a clock at the spaceport on Mars to noon. The Mars noon is, of course, delayed by the light-speed lag. Will the ship clock, slowed by acceleration and velocity, match or not match the Mars clock when that ship arrives on Mars?

THE END.

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